ELECTRICAL SOUTH

FEBRUARY
1945

FANS by HUNTER-CENTURY

58th SEASON

52-In Hotel Type

24-In "Airspread Ceiling

HUNTER, who has made fans and ventilators exclusively during 55 years, is now operating under War Production Board restrictions. • No more fans will be made except for the Army, Navy and Maritime Commission. HUNTER unfilled orders now on hand represent contracts with Government Agencies. • Certain sizes of belted exhaust types can be made available for Government hospitals and other war industries, subject to limited material inventories now on hand.

HUNTER FAN & VENTILATING COMPANY, INC.

Factory: FULTON, N. Y.

General Sales Offices: Memphis, Sterick Bldg. *Eastern Sales Office*: New York, 92 Warren Street *Western Sales Office*: St. Louis, 1706 Olive Street

Sales Offices:
ATLANTA
CHICAGO
DALLAS
HOUSTON
LOS ANGELES
PHILADELPHIA

Zephair Comfort Cooling and Commercial Ventilators

Sales Offices:
BOSTON
CLEVELAND
DETROIT
KANSAS CITY
NEW ORLEANS
PITTSBURGH

SYLVANIA NEWS
CONTRACTOR EDITION

FEBRUARY *Published in the Interests of Better Sight and Sound* 1945

New "Long-Slim" Fluorescent Lamps Will Soon Complete Sylvania Line

Instant-Starting Type Will Open New Sales Markets in Commerce, Industry

New fluorescent lamps soon to go into commercial production at Sylvania Electric are expected to open up broader markets for installation of fluorescent lighting. Production of these lamps will make available to contractors a complete line to meet every fluorescent lighting need.

Outstanding among these additions to the Sylvania line are four long, small-diameter lamps of the instant-starting type, requiring no starter. ¾" diameter lamps will be produced in 42" and 64" length; 1" diameter lamps in 72" and 96" lengths. All will use a single-pin base.

These lamps will have a number of important features, which will assist contractors in promoting their use in many new fields of application.

From the standpoint of appearance and adaptability, their small diameter is a definite advantage, particularly in such uses as showcases, coves and display lighting. The longer units are of special interest in continuous-row applications, where they allow maximum length uninterrupted by mounting equipment.

An entirely novel feature of these new lamps is that they can be installed for operation at either of two current ratings, by proper selection of the ballast. Operation at the lower current rating results in low brightness. This feature is particularly desirable in narrow corridor areas, small showcases, and for many decorative purposes.

The lamps will require new sockets and ballasts, which, because of wartime limitation, are not expected to be available for several months. The lamps themselves are now available in sample quantities, and the technical data published below will be of value in preliminary planning for their use in future installations.

NEW MINIATURE LAMP

Also being added to the Sylvania line is a 21" lamp, ⅝" in diameter, rated at 13 watts. This lamp is of the conventional starting type, and uses a standard miniature bipin base.

The addition of these new lamps to Sylvania's extensive list of standard and miniature fluorescents will place contractors in an excellent position to promote fluorescent for every purpose.

THE NEW ADDITIONS TO SYLVANIA'S FLUORESCENT LINE

LONG-SLIM LAMPS	CURRENT MILLIAMPERES	APPROX. INITIAL LUMENS	LAMP LIFE HRS.
42" T6 (42", ¾")	100 200	900 1400	Life of Long-Slim fluorescent lamps at 200-milliampere operation is expected to be comparable to that of 40-watt standard fluorescent lamps. Definite ratings will be published as soon as life testing is conclusive.
64" T6 (64", ¾")	100 200	1400 2150	
72" T8 (72", 1")	100 200	1400 2350	
96" T8 (96", 1")	100 200	1950 3300	

MINIATURE LAMP	CURRENT MILLIAMPERES	APPROXIMATE INITIAL LUMENS	LAMP LIFE, HRS.*
21" T5 (21", ⅝")	160	Daylight . . . 490 White 580	1500 on a 3-hr. Cycle

*Under specified test conditions

SYLVANIA ELECTRIC

SYLVANIA ELECTRIC PRODUCTS INC., Salem, Massachusetts

MAKERS OF FLUORESCENT LAMPS, FIXTURES, ACCESSORIES; INCANDESCENT LAMPS; RADIO TUBES; CATHODE RAY TUBES; ELECTRONIC DEVICES

ELECTRICAL SOUTH is published monthly by W. R. C. Smith Publishing Co., Marietta, Ga., and Atlanta, Ga., U. S. A. Subscription rates, United States and Possessions, $1.00 for one year; Canada, $1.50 per year; Foreign Countries, $2.00 per year. Entered as second class matter at the postoffice, Marietta, Ga., under Act of March 3, 1879.

Volume 25 Number 2

Electrical Contractors and Wholesalers Salesmen are Spreading this gospel ARE YOU?

IS THERE A GIANT HANDCUFFED IN *Your* PLANS?

Do your plans for post-war building or modernizing handcuff the giant, Electricity, by inadequate or improper wiring? Will skimpy circuits based on yesterday's needs and standards deprive factories, stores, schools, institutions and homes of tomorrow of the full benefit of their most willing servant?

Insufficient circuits, small wires or wires of low capacity greatly hamper the efficient distribution of electricity within a building. Wattage paid for at the meter is not delivered to lights, appliances or machines and these in turn do not function at their peak efficiency. Adequate, planned wiring is an essential if the greater use of electrical equipment that is promised us is to do its full share of work for you.

It adds comparatively little to the initial cost of a building to wire it for the needs of years to come. It is sound judgment, even for today's needs, to bring the obsolete wiring of older buildings abreast of the times. We will be glad to help you plan your wiring. The Okonite Company, Passaic, N. J.

PERFORMITE

In your plans for the future, consider, for example, our Hazard Division's Performite wires, Types RH and RHT. They are highly resistant to heat and can carry nearly 50% more current than ordinary code grade wire of the same size. These wires meet accelerated aging tests with a wide margin of safety. For further data, write us.

ADEQUATE WIRING THE KEY TO INCREASED PRODUCTION

OKONITE and HAZARD

OKONITE SINCE 1878 **insulated wires and cables**

3691

THE DAY IS COMING

A few years back, when production of household appliances was stopped, sales rationed, and no one knew what next to expect, we continued to extend our full regular financing service. Appliance dealers continued to be served by us with full collection service on outstanding accounts. New plans were created for emergency items taken on by the dealer.

When war-time restrictions are eased, and new refrigerators, washers, ranges and radios begin to roll from the assembly lines, we'll still be in there pitching and backing you up.

The kind of service we have maintained through wars and depressions . . . through the unprecedented period of non-production and rationed sales . . . is the kind we will continue to give you, on an even bigger and better scale, from now on.

COMMERCIAL CREDIT COMPANY

BALTIMORE 2, MARYLAND

Capital and Surplus more than $65,000,000

Credit Bankers to America's Families for 33 Years

The NERVE CENTER OF YOUR ELECTRICAL SYSTEM IS *Your Switchboard*

All production depends on it. In turn, it must be absolutely dependable for the life of your electrical system. The best, therefore, is none too good. For more than 50 years, back when electricity was just starting to walk, the Frank Adam Electric Company has been making switches and switchboards. The Shutlbrak Switch is our finest *operating* switch.

Sound engineering developed in the FA Shutlbrak Switch is a shuttle movement faster than the eye . . . silver on copper contacts under tempered steel compression within a completely insulated, damp-proof chamber . . . arcing tips away from contact points . . . contacts that improve with operation. These improvements alone revolutionized heavy industrial switching.

But we did not stop there. The patented FA Kamklamp fuseholder was designed to hold both ferrule and knife blade terminals in a permanent grip. For low resistance, positive cable connection, FA Shutlbrak Switches are equipped with FA Pressure Type (solderless) Connectors.

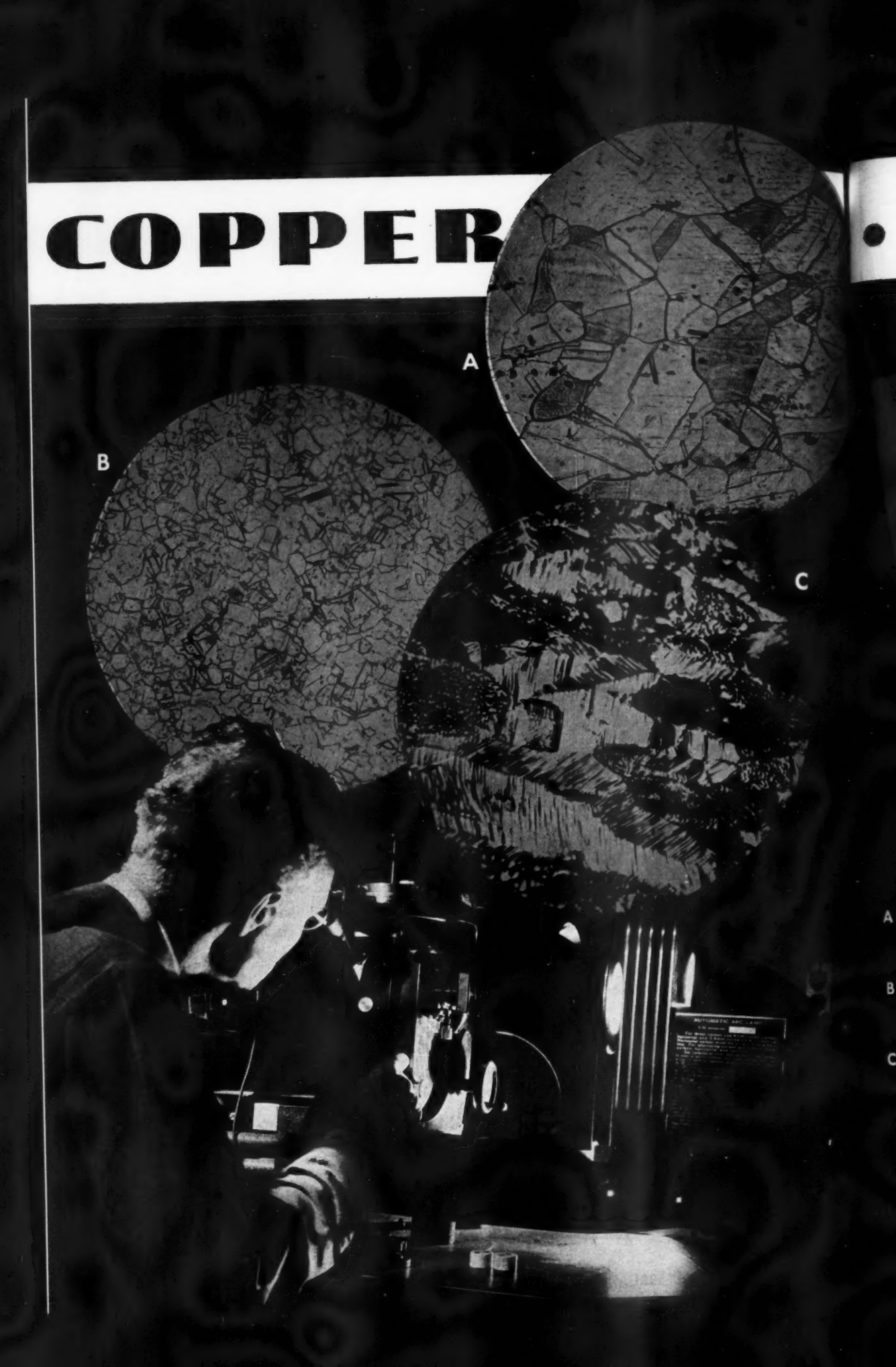
If your installation calls for quality equipment, see our local representative. His years of experience are at your service. Write for his name and address and Bulletin Number 70 describing Shutlbrak Switches, Switchboards and Panelboards.

Frank Adam Electric Co., Box 357, St. Louis, Mo.

Makers of Busduct, Wire and Cable Duct, Switchboards, Panelboards, Quikheters, Service Equipment and related items.

FA **PRODUCTS** *"The Sign of a Better Job"*

COPPER



. . IS BASIC

From (1500x) microscopy to pilot-plant testing, Research here seeks constant product betterment

In the General Cable Research Laboratory at Bayonne one soon becomes conscious that this unit is not just a laboratory but an institution on which the technical advance of an industry largely depends. At what speed rate can continuous annealing of copper be accomplished? How control materials for more perfect surface finish? What refinement of raw material and process specifications for specific use-applications? General Cable scientists delve deeply that the end product may be still more serviceable, of still greater uniformity, and of no greater cost.

A Grain structure of annealed hard drawn wire—X1500

B Grain refinement of Hot Rolled Rod—X200

C Elongation of grains in longitudinal section of wire—X1500

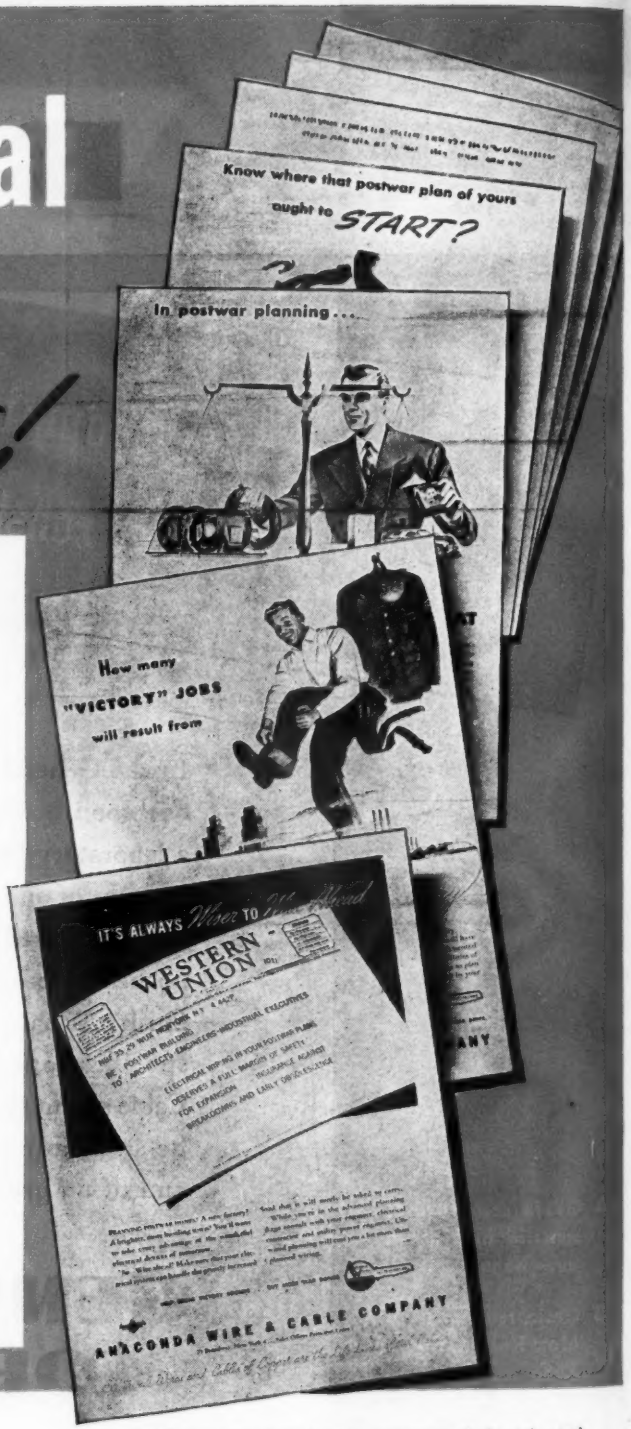
GENERAL CABLE CORPORATION

Manufacturers of Bare and Insulated Wires and Cables for Every Electrical Purpose

Electrical Wiring *comes first!*

Every electrical utility will benefit from Anaconda's national advertising campaign

ANACONDA's advertising campaign is aimed at creating a sounder basis for your postwar business. It urges postwar planners to allow extra capacity in wiring plans. It puts the spotlight on the big increase in the demand for power and equipment sure to come.

Don't overlook the opportunity to tie in with this special campaign. Plan now to get a maximum share of its benefits. Link your own promotion to your local adequate wiring bureau activities and Anaconda's basic advertising theme: It's always wiser to Wire Ahead! 44268

Know where that postwar plan of yours ought to START?
In postwar planning...
How many "VICTORY" JOBS will result from
IT'S ALWAYS Wiser TO
WESTERN UNION
ANACONDA WIRE & CABLE COMPANY

BUY MORE WAR BONDS

• Full pages like these, in color, appear regularly each month in Time, Newsweek, Business Week and leading industrial publications read by America's foremost postwar planners.

ANACONDA WIRE & CABLE COMPANY

25 Broadway, New York 4... Sales Offices in Principal Cities

Electrical Wires and Cables of Copper are the Life Lines of our Nation

ELECTRICAL SOUTH

VOL. 25 FEB. 1945 NO. 2

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SOUTHERN AUTOMOTIVE JOURNAL — COTTON
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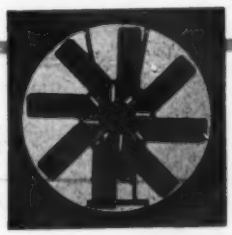
It's IMPORTANT

That You Take Orders NOW!

Coolair TRADE MARK

EXHAUST FANS and BLOWERS



Wise dealers are continuously on the job every day soliciting orders — and *selling* orders for COOLAIR Fans and Blowers! We are in the position to handle your orders on an "order first — shipment first" basis, so it is important that you help your customers anticipate their needs early — and order early!

CONTACT ALL PROSPECTS NOW

- because—CMP Regulation 5 permits almost any type of business, able to certify that the equipment they order is necessary to the successful operation of their business, to assign their own preference ratings on purchases up to $500. Form WPB 541 (Formerly PD-1A) can be filed for orders in excess of $500.
- because—many Government orders are still available to wide-awake dealers who keep in touch with these prospects.
- because—by selling your customer on an "order first—shipment first" basis, he will be assured of as prompt delivery as possible.

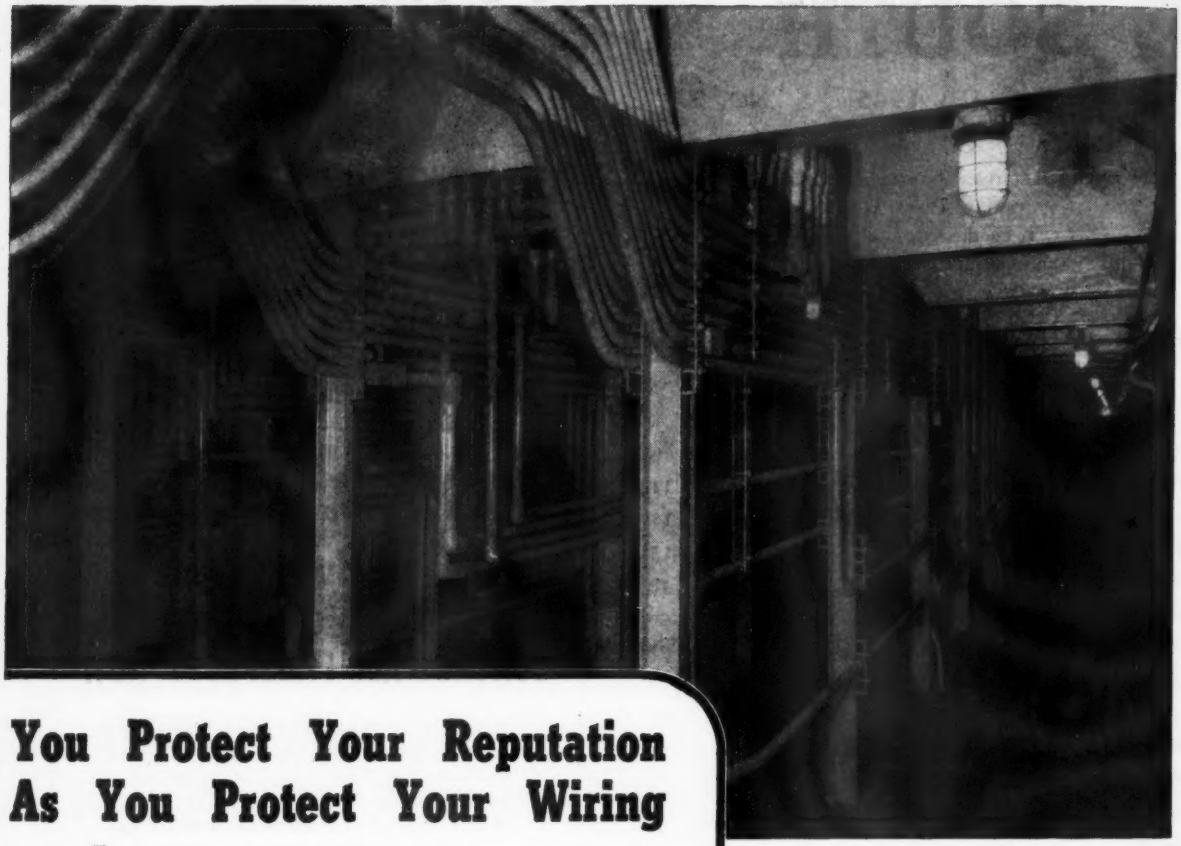
DON'T DELAY — START TODAY . . .

contacting every likely prospect. We will be glad to help you with any priority problems that may arise. Send for a supply of the latest Coolair literature and current price list.

A full description of the Coolair line, with tables showing models, dimensions, performance data, etc., can be found in SWEET'S CATALOG A.S.H.V.E. GUIDE ELECTRICAL BUYER'S REFERENCE

AMERICAN COOLAIR CORPORATION . . . Manufacturers
3604 MAYFLOWER STREET
JACKSONVILLE 3, FLORIDA

FOR SAFETY'S SAKE . . . USE CONDUIT (Full Weight Rigid Steel)



You Protect Your Reputation As You Protect Your Wiring

IN war or peace, Americans judge a man, a machine, or a wiring job by performance--performance not just today, but tomorrow, and for a lifetime.

War shortages and priorities have made necessary certain emergency practices that do not meet the high standards of the National Electrical Code...as in the use of conduit. As every contractor knows, the only code-approved wiring system, designated as moisture-, vapor-, dust-, and explosion-proof, for use in hazardous locations and occupancies is a standard-threaded, rigid steel conduit.

Now, as you rewire for reconversion and wire new jobs for post-war buildings, you can count on using Youngstown Buckeye Conduit--the full-weight, rigid steel which for many years has been first choice of contractors and customers alike. Whenever you use Buckeye you give your wiring the best possible protection, and you likewise protect your own reputation for safe methods and sound practice.

THE YOUNGSTOWN SHEET AND TUBE COMPANY
Youngstown 1, Ohio
Manufacturers of
CARBON, ALLOY AND YOLOY STEELS

BUCKEYE TRADE MARK YOUNGSTOWN CONDUIT

Ask your distributor for
Youngstown Buckeye Conduit-Pipe and Tubular Products-Sheets-Plates-Electrolytic Tin Plate-Coke Tin Plate-Bars-Rods-Wire-Nails-Tie Plates and Spikes

Survey Indicates Aggressive Plans For Postwar Merchandising

ENTERING their fourth year without new merchandise to sell, electric appliance dealers have added more than three hundred other items to sell as a means of staying in business, according to returns shown by a survey among 17,000 dealers. Paint, furniture items, glassware, floor coverings, wall paper, seeds, luggage, roofing, hearing aids, books, and used cars are listed as added lines taken on by appliance dealers. More than 80 per cent of the several thousand dealers replying to a questionnaire said they would keep one or more of the substitute lines in postwar.

Listed as other means of continuing in business were repair and parts service for appliances, supplied by 12 per cent more dealers during the war period than normally; appliance "swapping," by which broken devices are repaired and restored to use; and doing other types of repair work necessitated by restricted service on all types of equipment.

The poll is a result of a home study course in wartime operations and peacetime merchandising being sent monthly by Edison General Electric (Hotpoint) Appliance Company to 17,000 appliance dealers across the country. Of those receiving the course, 47.9 per cent are specialized appliance dealers, 17.1 per cent are furniture stores, 12.9 are hardware stores, while 5.5 per cent are department stores. Public utilities and others make up the balance of the enrollment.

The questionnaire, enclosed with one of the regular monthly lessons, included ten questions on a self-mailing card. The first question asked was, "in postwar, which of the following appliance lines do you intend to sell?"

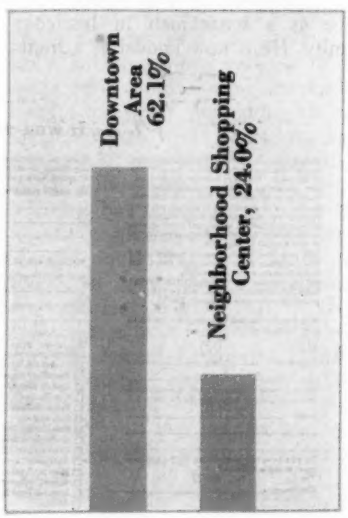
Household refrigerators, with 93.2 representations, will be the appliance sold by the largest number of dealers, as it was before the war. Vacuum cleaners with 86.3, and radios with 85.6, are next in dealer popularity. Following these three, the table appliances (toasters, etc.) will be sold by 82.7 per cent of the dealers replying. The electric range is due for greatly increased representation, with 80.4 of the dealers saying they will sell this appliance. The washing machine answer was divided into two parts, with 77.9 per cent saying they would sell automatic machines, and 76.1 per cent specifying conventional type machines.

Among the surprise favorites for postwar among dealers are: hearing aids, 14.8 per cent; room coolers, 52.5 per cent; and kitchen cabinets, 48.8 per cent. The cabinet figure indicates

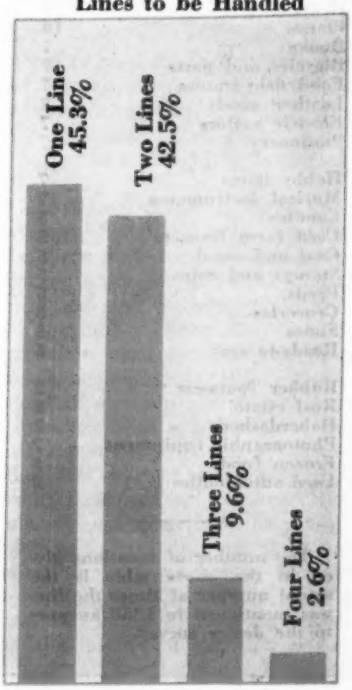
Dealers in Per Cent of Total Who Will Sell Certain Appliances

Appliance	*Per Cent*
Household refrigerators	93.2
Frozen food cabinets	70.6
Electrical ranges	84.4
Gas ranges	50.0
Space heaters	52.2
Dishwashers	65.6
Non-electric sinks	37.2
Garbage disposalls	49.1
Conventional washers	76.6
Automatic washers	77.9
Electric clothes dryers	40.3
Table top ironers	73.8
Portable type ironers	67.3
Radios	85.6
Hearing aids	14.8
Electric water heaters	65.3
Gas water heaters	26.0
Room coolers	52.5
Ventilating fans	62.1
Kitchen cabinets	48.8
Table appliances	82.7
Vacuum cleaners	86.3

Location of Stores



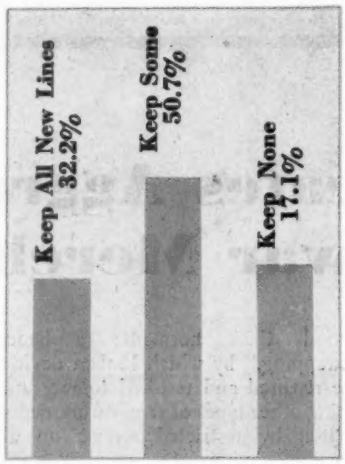
Number of Major Appliance Lines to be Handled



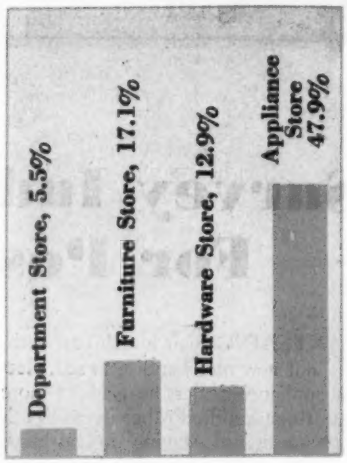
Merchandise Added Since the War Began	*No. of Mentions*
Paint and paint brushes	209
Furniture	199
Glassware	142
Repair parts, service work	124
Household furnishings	112
Floor coverings	99
Dinnerware	97
Gift items	97
Hardware	75
Toys	69
Ice refrigerators	60
Novelties	57
Small electric supplies	56
Phonograph records	55
Lamps	50
Heating stoves	42
Wallpaper	42
Used appliances	40
Pictures	37
Combination ranges	32
Home insulation	30
Mirrors	27
Auto supplies	27
Clothing	25
Wall cabinets and sinks	22
Floor polish and wax	19
Gas ranges	19
Sporting goods	19
Cleaning solvents	17
Jewelry items	17
Pottery	17
Sheet music	17
Crockery	15
Farm machinery, supplies	15
Plumbing and heating	15
Games	15
Pumps and water systems	15
Luggage	15
Seeds	15
Curtains, draperies	12
Roofing materials	12
Yard goods and notions	12
Hearing aids	10
Pianos	10
Books	7
Bicycles and parts	7
Food dehydrators	7
Leather goods	7
Electric motors	7
Stationery	7
Hobby items	7
Musical instruments	7
Candles	5
Used farm freezers	5
Coal and wood	5
Stamps and coins	5
Feeds	5
Groceries	5
Shoes	5
Ready-to-wear	5
Rubber footwear	2
Real estate	2
Haberdashery	2
Photographic equipment	2
Frozen food	2
Used automobiles	2

The number of mentions given in the above table is the actual number of times the line was mentioned in 1358 answers to the dealer survey.

Dealer Intentions with Regard to New Lines



Type of Stores Covered In Survey Returns



the approximate number of dealers who plan to sell complete kitchens, according to Ward R. Schafer, general sales manager for Hotpoint. He said that the great popularity for complete appliance ensembles for kitchens would "carry the electric dishwasher, garbage disposall, as well as metal base and wall cabinets to new highs in acceptance."

Schafer noted that appliance dealers volunteered hundreds of comments on their survey cards. These comments included opinions as to postwar prospects, views on dealer aids expected from manufacturers and distributors, and other indications that, "far from being in a state of suspended animation, the electric appliance dealer is perhaps the livest merchant in his community." He commented, "too much emphasis cannot be placed on the importance of the dealer's new place as a serviceman in his community. He is now known as a friend of hundreds of his neighbors. This new relationship has changed his position in the community, and we have heard from many dealers who have long lists of 'applications' for specific appliances as soon as they are available."

Schafer said that the home study course was mailed to all dealers who applied for it during 1944, but a change in policy is being devised by which it will go to Hotpoint dealers only in the postwar period. "We have plans to make the information in our merchandising study course much more specific on many problems than it has been. To do this, it will be necessary to treat of direct product information, and this material will be of interest mainly to Hotpoint dealers." He added that the change in policy would not be effective immediately but would be instituted as the time for resumption of merchandising drew near .

Please, **IT WILL TAKE ONLY A MOMENT!**

With this issue of "Planned Electrical Merchandising" you have now received the first four of the series. The other bulletins on vital subjects pertaining to retail merchandising will continue to be mailed at thirty day intervals. So that we may continue to supply you with constructive information in future bulletins, it is important that we know your frank opinion of this service, as well as your suggestions as to how it could be improved.

Will you, then, be kind enough to answer the few questions listed below, and return this letter to us as soon as possible?

Do you consider the "PLANNED ELECTRICAL MERCHANDISING" Bulletins will be helpful in planning your future business? Yes ☐ No ☐

Which of the first four bulletins have you found most interesting?

1. ☐ 3. ☐
2. ☐ 4. ☐

Comments: _____

What subjects relating to retail merchandising would you like to have covered in future bulletins? _____

Do you have any suggestions for the improvement of these bulletins?

Yes ☐ No ☐

Comments: _____

Since the curtailment of the manufacture of appliances, what lines of other types of merchandise have you been selling that you did not handle before the war? _____

Which, if any, of the above items do you intend to continue to sell in postwar? _____

In postwar, which of the following appliance lines do you intend to sell?

- ☐ Household Refrigerators
- ☐ Household Frozen Food Cabinets
- ☐ Electric Ranges
- ☐ Gas Ranges
- ☐ Space Heaters
- ☐ Dishwashers
- ☐ Non-Electric Cabinet Sinks
- ☐ Garbage Disposall Units
- ☐ Conventional-Type Washers
- ☐ Automatic-Type Washers
- ☐ Electric Clothes Dryers
- ☐ Table-Top Ironers
- ☐ Portable-Type Ironers
- ☐ Radios
- ☐ Hearing Aids
- ☐ Electric Water Heaters
- ☐ Gas Water Heaters
- ☐ Room Coolers
- ☐ Ventilating Fans
- ☐ Kitchen Cabinets
- ☐ Table Appliances
- ☐ Vacuum Cleaners

Of the major appliance lines you will sell in postwar, how many brands of each line do you intend to handle?

- ☐ One
- ☐ Two
- ☐ Three
- ☐ Four

Is your present store located in:

- ☐ Downtown Area
- ☐ Neighborhood Shopping Center
- ☐ _____

What is your type of store?

- ☐ Department Store
- ☐ Furniture Store
- ☐ Hardware Store
- ☐ Appliance Specialty Store
- ☐ _____

We are not asking that you identify yourself by revealing your name or street address, but for the purpose of this study, we will appreciate it if you will give the name of the city in which you are located.

CITY _____

Thanks!

A new era in commercial lighting is promised for the postwar period. Designs will have as their objective the basic principles of good merchandising: attraction, atmosphere and appraisal. The architects of tomorrow will design lighting along with the building interiors. Interesting effects will be achieved with hidden sources.

WHAT'S AHEAD IN LIGHTING

By H. M. Horton*

IN ORDER to establish a "base mark" for projecting and forecasting trends as to "What Lies Ahead in Lighting Developments," it can be said that the three years prior to "Pearl Harbor" were perhaps more important than any previous fifteen year period in the history of the electrical industry. Up until that time, practically our entire resources were devoted to the development and improvement of light sources for producing energy within the visible portion of the spectrum. Suddenly, we broke out to the left and to the right of the visible portion of the spectrum and delved into the realms of the invisible.

There was announced the ultra-violet, germicidal lamp for killing the air-borne bacteria; sunlamps generating a slightly different form of ultra-violet, and providing the same health giving rays obtained from natural sunshine; and still another form of ultra-violet energy referred to as "blacklight," used for invisible laundry markings, crime detection, and a multitude of unusually interesting, luminous effects.

We broke out also into the opposite side of the spectrum and developed a line of infra-red lamps known as drying lamps and as heat lamps: the former being applied for the drying of synthetic lacquers and paints, moisture evaporation, etc., and the latter being strictly a therapeutic lamp.

Lastly, but by no means least, the greatest single development of them all was unquestionably that of the fluorescent lamp, where we increased lamp efficiencies from two to three times greater than that obtained from the incandescent lamp, and found a way to provide soft, shadowless light of varying color temperatures, much cooler per watt than any we had ever been able to obtain from previous light sources.

Now, we stand on the threshold, about to open the door into a new era of lighting progress. First, let us examine briefly, but specifically, some of the important factors that will affect the commercial lighting market after the war.

According to *Chain Store Age*, an average of approximately $5,000 will be spent for modernization per store for the better class of stores during the first year after the war.

The Libbey Owens Ford Company is making plans for visual store fronts made completely of glass where instead of conventional store windows the whole store will become a show window itself. This will be adapted, they feel, to such merchandising establishments where the customer, feminine for example, would have no objections to having her neighbors know what she was purchasing. However, with such stores, more care must be exercised in the painting and lighting of the interior to overcome window reflections. In other words, there must

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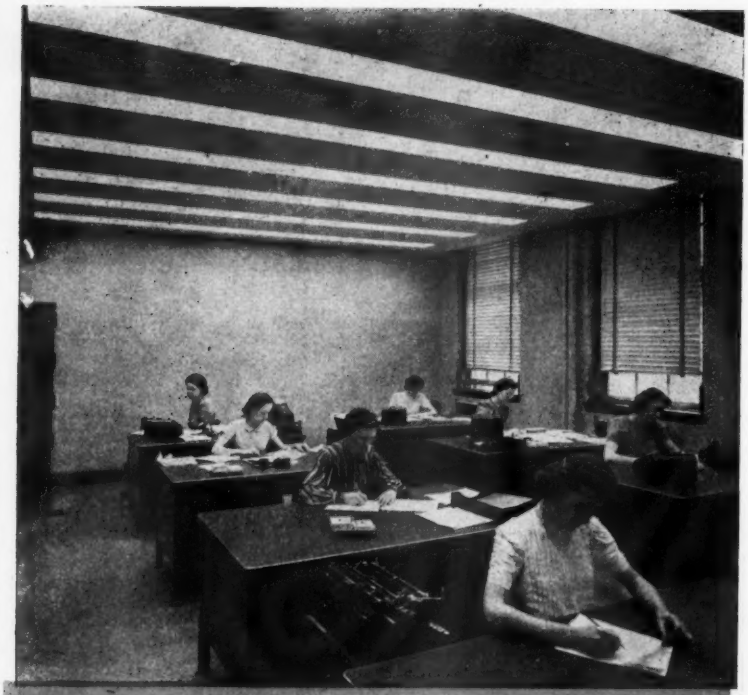


Proper lighting for offices and schools had just become a reality when the war brought an end to new construction not directly related to the war effort. A tremendous backlog of modernization in these two fields has accumulated in the last few years.

be enough brightness within the store to overcome reflected images in the glass. Obviously, this will call for increased illumination of high footcandle brightness.

The architect will be called upon to plan more lighting in the future because it will be designed with the building. He must be educated to see that the lighting does these three things: serve the purpose for which it was designed; is logical; and is pleasing to the sight. If these A. B. C's. of good lighting design practice are followed, then we shall see illuminating practice graduate out of a science alone into both science and art. With art and science teamed together, lighting can be made something truly wonderful to behold.

The lighting fixtures in tomorrow's store will be, to a great extent, of the shielded type. It appears that chain stores, such as Woolworth's, usually set the pace and styles in lighting, as well as other things. Woolworth says they are going to use shielded fixtures in their stores of the future so that customers can see the merchandise and not the fixtures. However, a re-

(*Continued on page 65*)

Service Station Maintenance A Full-Time Specialty

By L .H. Houck

A NEW NICHE of specialization for the electrical contractor is being exploited by John Burke, owner of the Airline Electrical Service, Kenner, La.

The Airline Electrical Service, while it will do almost anything any other electrical contractor will do, has specialized in automobile service station maintenance for the past year and a half.

Calls for his service, Mr. Burke said, now keep himself and two helpers busy every day and he could use several more men if he could find competent electricians who have studied the intricacies of magnetic switches and explosion-proof wiring.

Previous to entering the electrical contracting business and specializing in service station maintenance about a year and a half ago, Mr. Burke spent twenty-two years in the electrical trade, most of it for the major oil companies installing and servicing pumps, compressors, hydraulic lifts and other gasoline station equipment.

Chain Stations Good Customers

A unique and money-making feature of the business is that he services nearly a thousand stations and yet his checks come monthly from probably ten large firms. This is because most of the stations are owned by the major oil companies and the oil companies provide the service.

When he started up in business he sold his first "bill-of-goods" to the oil companies—offered to service their electrical equipment and provided them with telephone numbers where he was available night and day. Since that time there has been no time to rest because the calls come in faster than the three men and a truck can answer them.

Besides that, he bids on the wiring on any new stations that are to be built.

What happens at service stations making so much service necessary?

For one thing, the constant vibration of traffic near the pumps rocks the concrete and seesaws on the buried wiring. All service station wiring is lead-covered. Finally the lead coating is broken and then electrolysis sets in with the result there is an open circuit. A call is put in for the Airline Electrical Service and Mr. Burke and his crew run it down. Sometimes it's a short. Sometimes it requires digging up the concrete.

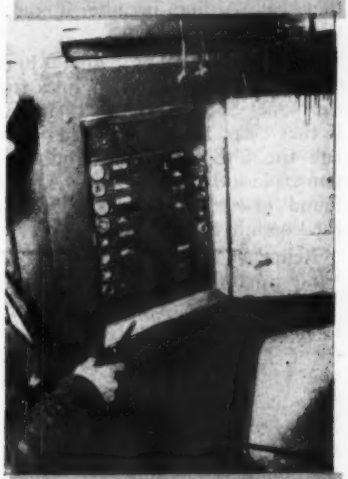
Service station wiring under the electrical code is a very serious business. Every line and all the fixtures from the pumps to the circuit panel inside the station must be explosion proof. This means that a junction box in a pump not only must be air and watertight but must also be of strong construction. Wiring is sealed inside the conduit by pouring a mixture of litharge and glycerine around the lead-sheathed cables, which hardens in an hour. These seals made at every joint insure that the conduit will not conduct the highly explosive vapors from the gasoline pumps to the service panel where they might be ignited by the arc from a switch operation. Inspection of service station wiring where the code is enforced is thorough.

Another reason for service calls is that the motor that operates the gasoline pump has to run in an air-tight explosion-proof case. Most of them are one-third horsepower and they are protected by a thermal cutout which allows them to run about twenty minutes continuously.

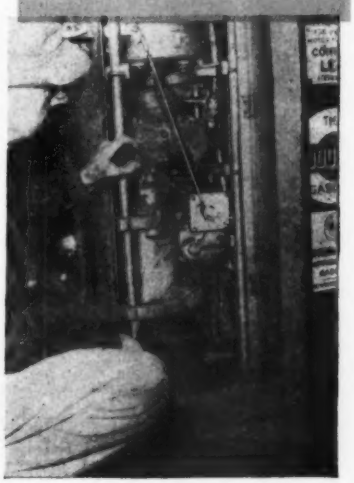
Sometimes these motors heat slightly above their usual temperature with the result that the thermal cutout throws sometimes before five gallons of gasoline can be pumped out even under ration conditions. They call Mr. Burke! Sometimes he has to replace the motor. Sometimes he finds that a high resistance short in some part of the wiring, caused by electrolysis, has raised the normal temperature of all the conduit and this extra heat which would have gone unnoticed in building or factory wiring, has been just enough to throw the safety cutout on the pump motor.

All service stations have one air compressor and many of the larger

Flood light and sign wiring frequently require service after high wind velocities. Below, typical service station type panel board.



Below, inside of gasoline pump showing explosion-proof pump motor. Air proof seals keep gasoline vapors out of the electric conduits.



ones have more than three. Some of them are single-phase jobs while the motors on others are three-phase. Some are one-half horsepower and some run up to ten horsepower. All of them have some form of diaphram switch which throws the current on and off at predetermined pressures.

Some of the switches, particularly the three-phase, combine a type of make-and-break switch with a magnetic switch all arranged to operate according to the pressure on a rubber diaphram. Constant use and constant arcing make renewal of the contacts necessary. The diaphrams last several years but usually need to be installed by an experienced electrician. All these troubles make calls for the Airline Electrical Service.

Airline services the neon equipment and the flood lights on the stations as well as the other equipment. When fuses start blowing in a service station they call Airline because it means trouble.

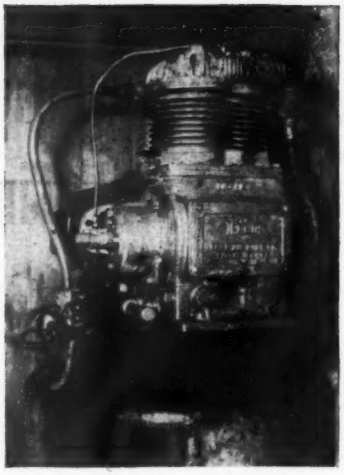
Mr. Burke's usual procedure is to uncouple his explosion proof lines from the panel box and check them first. If they clear, then he proceeds to isolate the line giving the trouble. In non-explosion proof lines, he has found the condensation of vapor inside the conduit to cause shorts.

Remedies are at hand for the electrical troubles of the service station. The Airline Service rebuilds the motors, repairs thermal cutouts or renews them; renews and rebuilds all automatic pressure switches; fits new rubber diaphrams, cutting them from large sheets, rather than stocking many sizes manufactured to fit; and services the pumps and motors.

Airline Electrical Service figures its territory extends on a radius of 25 miles from their shop. Roughly speaking, there are nearly 2000 service stations in this territory and only this firm specializes in taking care of their troubles.

In addition, they service the bulk stations owned by the oil companies who call them to service their filling stations. There is power wiring and pumps at the bulk stations, where the gasoline is transferred from railroad car to tank truck.

An electrical contractor desiring to engage in this specialty would obtain his business from the oil companies first. A canvass of ten major oil companies in his town might give him the business of servicing from a thousand to fifteen hundred service stations. Once going he would find that many of the independent stations would call him for service as his reputation spread.



Common type of air compressor used by automobile service stations. The air pressure switch, source of some trouble is at lower left.

This light and sign standard fell at 3:30 A.M. at one station breaking electric lines, and putting the station out of service. Pipe had been full of water and rusted away at base. Below, Mr. Burke, owner of the Airline Electrical Service, and his "trouble shooting" car.

The reputation of Mr. Burke for handling electrical pressure switches and complicated apparatus spread to a nearby army camp where their new heating equipment failed to function. There he found three voltages, 110, 220 and transformer stepdowns supplying 24 volts. These voltages were used on oil burners, motors and a vacuum switch which cut off when there was nothing in the steam or water lines; a float switch to regulate the height of the water in the boiler; a thermostatic switch which worked with the vagaries of the temperature; a limit control switch which operated just this side of dangerous pressures and an automatic switch in the water line to the boiler which operated when the water did not flow and shut everything off but the telephone.

That was the setup for the gas heating in each building and there were fifteen or twenty buildings. Someone had mixed the 220, the 110 and the 24 volts. No one could tell what switch was throwing when it shouldn't!

The experience of the Airline Electrical Service with filling station equipment came in handy on a job like that and they soon had the wires carrying the proper voltage and the switches operating according to catalog and blueprint.

MAINTENANCE IS BIG BUSINESS

By H. R. Meyer*

MAINTENANCE in this country is not only a vital necessity, but also a big business. That the electrical end alone shares a spot in the sun is indicated by the fact that there are over 6000 major electrical repair shops in this country.

What is maintenance and what constitutes its essential elements? While it might be defined in a number of ways, I like this one—"Maintenance is that operation which, through inspection, repair and replacement of parts, assures maximum life and production capacity." In maintenance work, as it should be carried on today, there are, among many details, two main functions which are essential if the best possible job is to be done.

First, we have that item of prime importance, a complete maintenance setup by the operator of the equipment. And second, the part that the manufacturer plays. It is this latter phase that I will discuss here.

With the highly competitive market which exists on most fabricated items, particularly those in the electrical field, it is obvious that constant research work must be carried on. That such research will not only continue but must be intensified, is indicated by the speed at which we are now using up our natural resources. We must start soon to consider the more efficient use of materials or on some elements we may find ourselves in the same position of many smaller nations who are continually fighting for a higher standard of living.

While war is a great waster of natural resources, it stimulates creative work so that man may always have a substitute for the things that are gone. A shining example is the part that glass insulation has played in our production operations during the past three years. (Fig. 1) While this item was not a "war baby," it will play a great part in that after-war conservation period. With the difficulty in obtaining that other important Class B item, asbestos, glass has really saved the day.

As an example of the growth of the

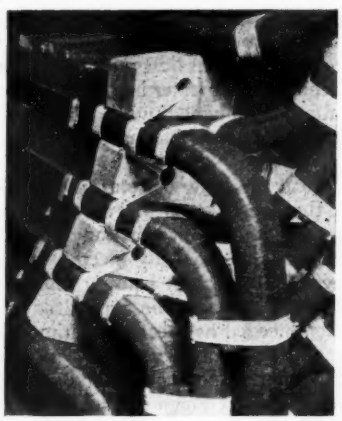
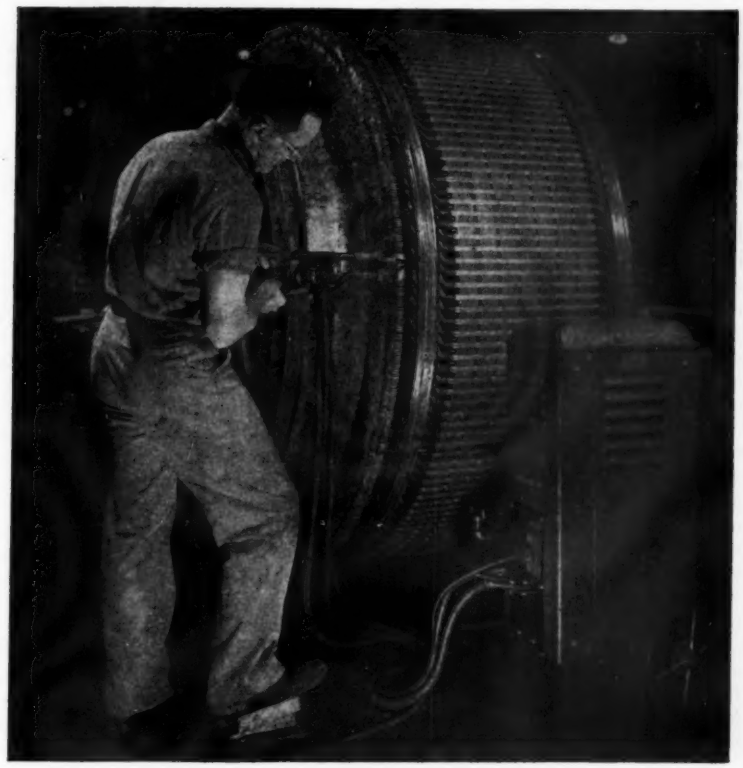


Fig. 1 (Left) Thermostable, moisture resistant, vermin-proof glass tape will help keep electric motors out of repair shops in the future. With the difficulty in obtaining the other important Class B insulation item, asbestos, glass tape has really saved the day in some war production industries. Fig. 2 (Below) Maintenance problems are greatly reduced in motors operating at high temperature when conductor connections are brazed with Phos-Copper. The operator is shown here brazing armature coils to commutator risers.



*Manager, Maintenance Department, Westinghouse Electric and Mfg. Co., East Pittsburgh, Pa.

use of this material, our company in 1938, about the start of its use, used $38,000 worth as coil insulation. Just five years later, or 1943, we insulated our electrical machines with $960,000 worth of glass. This year, due to many additional applications, it will run about $1,500,000.

Glass as an insulating medium has been with us long enough for most of the kinks to be ironed out and to provide us with data as to what we can expect. In the war effort its use has permitted the production of motors for special purposes that could not otherwise have been made. It is this angle that is going to be of great aid in conserving materials in the postwar period. Before the war the average temperature for general industrial motors was only 26° centigrade. Just imagine the possibilities in that field.

High Temperature Problems

Steel mills, railways, and the mining locomotive fields have already taken advantage of the higher permissible temperatures. On the other hand, it takes care of the higher loadings with a given design of motor where, as in the case of the railway, glass insulation has permitted greater capacity in a smaller space.

As we tend toward higher operating temperatures, it is obvious that other parts of the motor, as well as the coils, mut be taken care of. Where it is found necessary for various reasons to operate commutator motors at temperatures higher than normal, other means than our every day solders must be found for connecting the armature leads to the commutator necks. Fortunately a material has already been developed for this purpose and means for its application are available.

While Phos-Copper and other similar brazing materials are not new, it is only recently that some general applications to rotating machines have been made. Today, practically all of our medium sized generators have connections made with Phos-Copper brazed joints. (Fig. 2) The armature coil leads of many direct current machines are connected to the commutator risers by means of Phos-Copper. The 5.7 kilowatt generators used on practically all bombers today are of necessity high temperature machines with full glass insulation. The armature coil leads are connected to the commutator bars by means of Phos-Copper brazing.

As Phos-Copper melts and flows around 1300 degrees, there is little to fear from open circuits at the brazed joints caused by temperatures that will not ruin other parts of the machine. Like many other operations, a technique is required, but it is simple in character and needs no special skill. If certain precautions are taken, good joints can be obtained. After a joint has been made, it can be unbrazed and rebrazed at least three times without adding any new brazing material.

This new process has not as yet been applied to large turbo-generators due to the large size of the joints, the amount of brazing material and the amount and length of time the heat must be applied. It has been found that it takes a combination of the right amount of material and heat to produce a joint that is not brittle.

A portable brazing unit that supplies the right amount of current at the proper voltage is now available in three sizes—5, 10, and 20 kilowatts. The brazing tongs have been developed and there is available literature covering characteristics and prices.

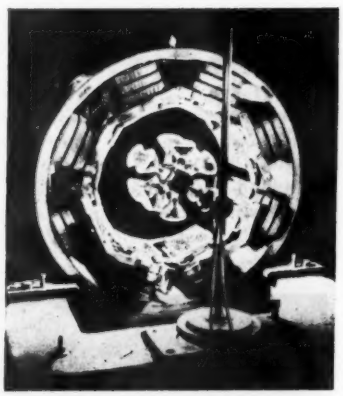


Fig. 3. The baking of insulating varnish is speeded up tremendously through the use of infra-red radiant heat lamps. Such lamps also permit great flexibility in set up of equipment.

The spraying of metals for the purpose of building up worn parts, while not a product of this war, has nevertheless been a great blessing. Through this process many parts which could not be replaced have been made useable. Machines which would otherwise have been lost have been kept available to produce our war materials. It is not my intention to go into the technical side of such operations, but rather to point out some of those important items which have made better maintenance possible.

Many foreign boats, including submarines, have come into our ship and navy yards for complete overhauling. These boats have very few spare or renewal parts. If it were not for metal spraying, much time would be lost in making such parts or replacing with complete machines, most of which would no doubt be on the restricted lists. We have built up worn shafts, bearing fits in housings and numerous details where wear has occurred.

Transportation in our major cities would have suffered had it not been for this idea. Bus parts at times were impossible to obtain. In a great many cases these have been reclaimed. The journals or railway car axles have been built up and ground to original size. One could add many items to this list such as the building up of impellers of pumps with stainless steel, slip rings of a-c motors and generators, and so on.

Radiant Heat Speeds Baking

With infrared heat lamps it is possible to perform a number of drying and baking operations which herctofore required rather extensive oven installations. It does not, for many operations, replace oven baking, but can be considered as an adjunct for many problems where an oven is not available. Again, it can be used when an oven would not be feasible. As it provides a radiant heat rather than one of convection, greater immediate penetration is obtained with consequent shortening of the baking period. (Fig. 3).

Great flexibility of setup is possible as the source of heat (the infra-red lamp) is of such size that any number can be assembled to meet a given need. With a given bank or assembly of lamps, heat can be applied as and where needed by means of wiring and switching arrangements. This method of obtaining spot light heat has been with us long enough so that there are on the market numerous designs of racks and fixtures to take care of most requirements.

Over the years much has been learned about the manufacture and application of carbon and metal graphite brushes for rotating motors and generators. While this product still has its ups and downs, we know that in most cases relatively long life can be expected.

Many of our machines operate in atmospheres encumbered with gases that are detrimental to good commutation. A difficulty sometime experienced is called threading and grooving. While there are numerous causes for this condition, contaminated atmospheres contribute to a considerable extent. Tests which have already been conducted indicate that a specially treated brush will help solve the problem.

Hipersil cores and coils has produced the greatest advance in electrical and weight efficiency in magnetic iron for quite a number of years. While it is a direct new apparatus development, its application to the repair of old transformers is another boon to maintenance operations. Through the use of this material, the weight of a given transformer is reduced 25 to 30 per cent. In maintenance work more capacity can be placed in the same tank of lower rating.

In addition to these specific broad coverage programs for the improvement of maintenance operations, there are many detail improvements which also contribute to a lowering of maintenance costs. Many of these items are the direct result of troubles in the field over a period of years, and maintenance men have contributed much in suggesting better ways of doing those things which the designer sometimes overlooks.

As with any contact of two parts carrying current, the ability to handle the current is not so much a question of mass as it is the number of points on each piece which meet each other and the pressure applied. During the past several years a compensating finger has evolved the design of which is such that the finger tip finds its own seat for maximum contact surface. Today this finger or its principle is standard on practically all control either for circuits carrying power or control currents.

The design of this finger was the result of twenty-one tieups a week in the subways of New York. It was aided and abetted by one of the men in charge of car equipment. Since its adoption, trouble from this source has been almost entirely eliminated. Another case where trouble and suggestions from maintenance men led to improved design.

During the past few years many protective devices have been used for motors and control. One of the most common of all of these items is the thermal cutout designed in many forms, but all based on the amount of current drawn by the operating equipment. Since it has been proven in practice that these cutouts have been a big asset in keeping production at a high rate when new motors and control are involved, does it not stand to reason that much can be done with older equipment not so protected?

A simple device used today with standard motors and which can easily be applied is the Thermoguard. This device, using the famous Klixon or Spencer principle, is simple in construction and easily applied to existing equipment not now protected. While overload devices have been in use for many years, their operation was based on sudden rushes of current considerably above the starting and continuous values.

A large percentage of protection is provided by these overload devices for sudden peaks, but there is no protection against continuous overloads under the current setting of the trip. It is at this point that the thermal trip plays its important role. As a simple maintenance tool, there are few developments which have such widespread use as this device. It will cut costs, save time and give many maintenance men more restful sleep.

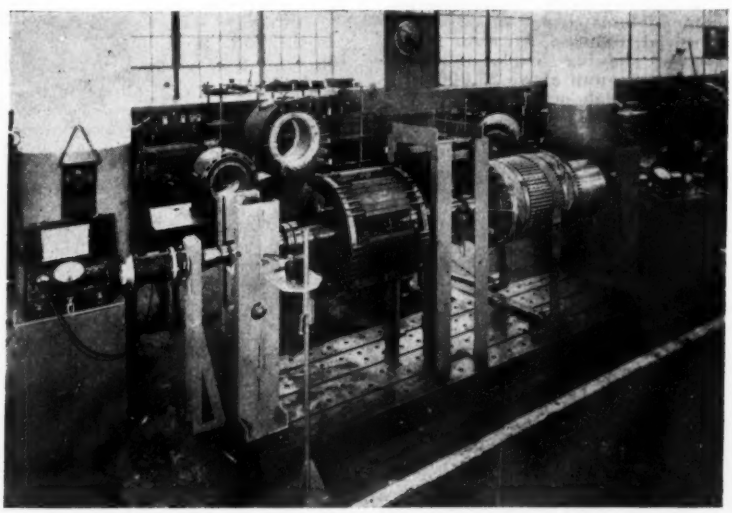


Fig. 4. Unbalance of armatures can be located in 1/8 to 1/10 of the time required for mechanical balancing with these modern dynetric balancing units. It is possible to precision balance armatures for 50 hp to 200 hp motors to 1/10,000 of an inch of linear movement.

Fig. 5. The Vibrometer is a new tool for the maintenance engineer designed to help him overcome the problem of vibration. It is an instrument for analysis rather than correction. If properly used, it will locate vibration and determine its nature.

Where as in the earlier machines the operating speeds were such that some unbalancing had little or no apparent effect, we have today an entirely different situation. With decreased size of motors, speeds have increased to a point where a slight amount of unbalancing spells ruin. Again, with our earlier machines practically all balancing was done under static conditions or in special cases on mechanical dynamic balancers, a lengthy and tedious process.

Today, through the miracles of electronics and allied research, we have the Dynetric Balancer which, with a few rather simple adjustments, permits almost perfect balance. (Fig. 4) A well balanced machine, as all maintenance men know, means no vibration and hence less wear and longer life. With this and similar machines, balancing has become a production line operation instead of an individual research job.

To facilitate the detection of the source of vibration and its magnitude, there has been developed a simple hand tool about the size of a slide rule. (Fig. 5) It operates on the vibrating reed principle with the period of vibration controlled by adjusting the length of the reed. As the length of the reed is changed by means of a thumb nut, an indicator on the shaft shows the frequency. With this Vibrometer a short treatise on its use is provided so that with a little practice, much time can be saved and trouble can be averted.

(Continued on page 64)

EXPLOSION-PROOF ELECTRICAL EQUIPMENT PROTECTS NAVY REFUELING BASES

By Harrie H. Bierman

THE INSTALLATION of explosion-proof electrical equipment – as soon as it becomes generally available—will offer to electrical contractors throughout the South an attractive source of additional volume.

Wherever electrical apparatus — motor driven pumps, for example — must be used in the presence of inflammable vapors, fittings which automatically prevent the contact of gases and arc produced sparks are necessary safety devices.

Large scale refueling provisions for aircraft or motor vehicles and certain industrial operations—spray painting, for instance—represent typical sources of civilian demand for explosion-proof electrical materials.

And, for highly obvious reasons, particularly during the past few years, the Armed Services have been large scale users of this kind of equipment in the construction of bases, where high-octane gasoline and other petroleum products are handled in quantity.

From the standpoint of completeness in detail, one of the best installations of explosion-proof equipment to be found is one made at a Navy base by a Southern electrical contractor.

In this case, the refueling setup consists mainly of concrete storage tanks, a piping system, processing equipment, motor driven pumps and fire protection apparatus. The fluids handled include gasoline of various octane ratings and fuel and lubricating oils.

Laid out in several horizontal rows, the storage tanks are of different capacities, and may be classified as large, medium, and small. Each tank is provided with one or more explosion-proof pump and motor units. In respect to number and working capacity, these tie in directly with the job which each must do.

The large tanks serve as circulating reservoirs for processed fluids. Fuel and lubricating oil are withdrawn from the tanks of the craft to be refueled. It is then filtered and routed to the reservoirs from which the fluids go into the refueling pipe system. Each reservoir is equipped with a pump powered by a 40 hp motor.

The smallest tanks have two pumps, one of which is powered by a 5 hp motor and the other by one of 10 hp. The medium size tanks are provided with but one 10 hp. motor pump unit, because they are intended to service only such craft as have their own pumping installations. These, and all other motors mentioned herein, are of explosion-proof type. That is, working parts are housed in to prevent any contact between electrical sparks and explosive vapors.

Motor pump units are enclosed in concrete housings located above the tank each installation serves. These, together with the tanks and all power transmission lines, are installed underground.

Contained in a pit, approximately 3 ft. by 3 ft., at each tank, motor controls consist of explosion-proof circuit breakers with side mounted, manually operated, start and stop buttons. The front and back sections of the housings surrounding these circuit breakers have a machined fit, and are bolted together. And they are so constructed that the front portion cannot be removed, except when the switch is in the "off" position.

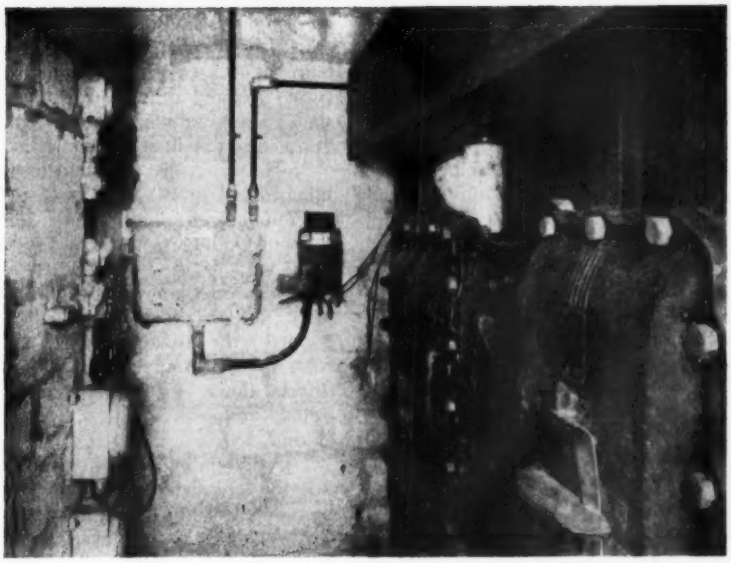
Ranging from 15 amp. to 600 amp. capacity, there are in all 54 such cir-

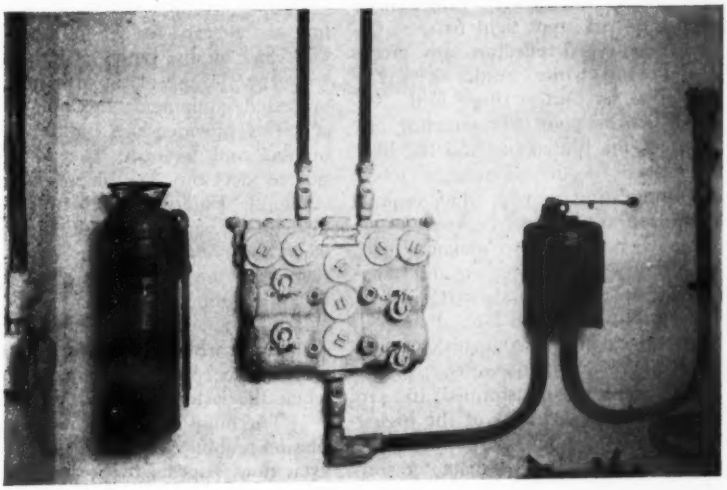
The U. S. Navy photos reproduced here, made especially for Electrical South, show applications of explosion-proof electrical equipment in a Navy gasoline refueling base. At left, below, is the pump control room illuminated by vapor-proof, industrial fixtures. At right is a closeup showing explosion-proof motor-pump unit above 25,000-gal. tank of high octane gasoline.

cuit breakers of 2-pole and 3-pole type, and of 600-volt rating. For operating convenience, where units of various size are group mounted, the larger ones are located above the smaller ones.

All connections were made by means of explosion-proof fittings. Between start and stop button and circuit breaker, a horizontal seal-off condulet was used. This and the vertical type are arc prevention devices. Heavily constructed, they have outlets for pouring in a sealing compound after wires are joined. The openings then are closed by pipe plugs having at least a 5-thread run.

Hubs for these seal-off fittings are both male and female in varying combinations. Some types have female hubs at both ends, while others have a male hub at either top or bottom. The job required something like 250 such fittings of various types, having hub openings ranging from ¾ in. to 2½ in.





Top: Explosion-proof equipment in main transformer vault. Telephone equipment is shown in left foreground and switch panel is located on back wall. Main circuit breakers and seal-off fittings are to be seen in right background.

Center: Closeup of explosion-proof electrical equipment in oil clarifier house. At left is fan control, lighting panel is shown at center, and dry type transformer at right. Note use of seal-offs in this installation.

Bottom: Main transformer bank, Pyranol filled, and equipped with oil fuse cutouts.

All junction boxes also are of heavy construction, explosion-proof type. Approximately 50 of these, in at least three sizes, were used.

The processing apparatus, which filters all fuel and lubricating oil entering the circulatory system, is powered by two motors, one of 5 hp. and the other of 10 hp. Here, too, all electrical appurtenances are of explosion-proof type.

In addition to that already described, the equipment of the base includes provision for fire protection and for taking fuel from, or delivering it to, automotive tank trucks. The fire protection setup consists of a series of strategically placed hydrants and two pumping stations. Each of these is provided with a 10 hp. motor and pump unit which pumps water when and if needed, from a continuous

source to the hydrants.

Underground, the tank truck stations, of which there also are two, form an auxiliary refueling setup tied into the general system. The handling of fluids between tank truck and circulatory piping is effected by two 10 hp., 2-way motor pump units at each station. And to prevent any accumulation of inflammable gases at these locations, the station interiors are thoroughly ventilated by means of 30-in., explosion-proof, electrical fans.

Lighting Requirements

The need for artificial illumination at this tank farm is comparatively small. Except for necessary flood lighting, its use is limited, for the most part, to water pumping and truck loading stations and to transforming and current distributing points. Wherever employed, however, lighting installations are explosion protected.

Interior lighting, where required, is provided by approximately fifty 100-watt lamps in vapor tight fixtures. Of industrial type, reflectors are green outside and white inside. Reflector and condulet form a single unit.

All control points for refueling operations, fire protection, and the like, are linked by an independent intercommunicating system. This equipment, too, is of special explosion-proof type, consisiting of 10 magneto telephones. Except for receiving and transmitting instruments, all parts including battery boxes, are housed in.

The local utility company supplies power at 2,300/4,160 volts, 3-phase, 4-wire. This is transformed to 440 volts. The employment of the higher voltage for feed line purposes means, of course, that smaller diameter conductor could be used, resulting in a major saving of critical copper.

In order to minimize the possibility of any power failure, the utility lines enter the base at two separate points. In addition, emergency power, which would be required to carry only a light pumping load, is provided by a 50 kva., auxiliary generator.

From each entrance point, utility furnished power goes to a separate, vault contained bank of three 37½ kva., Pyranol filled transformers. These, also, are of explosion-proof type, being totally enclosed and having wiped lead connections to the primary source. As regular bus-bar stock was not available when needed for transformer-to-secondary connections, 500,000 cm. cable with fiber holders was substituted.

Lighting distribution is handled by six explosion-proof, 4-circuit, 115/230 volt, 3-wire panels equipped with 15 amp., 2-pole branch circuit breakers. Current at 110 volts for lights, electrical fans and other low voltage installations is obtained by stepping down the 440-volt secondary by means of single phase, dry type transformers, rated from 1 to 3 kva.

From a safety point of view, one of the outstanding features of the electrical work is the thoroughness with which grounding was effected. Each piece of electrical equipment was bonded with No. 6 bare copper wire to a ¾-in. ground rod. This was driven down into the sub-surface water table, making a complete ground.

For the pulling in of wiring outside the tank field area, where pits for motor-control apparatus already exist, 4-ft. by 10-ft., concrete lined manholes were installed at 150-ft. intervals. And so important was the proper joining of cable ends considered that an expert cable splicer of almost national reputation was engaged for the job.

Because of the potential hazard involved in the use of portable and unprotected equipment, the plug-in receptacles provided are limited as to number and location. The few considered necessary are of special construction. Entering wires must pass through a vapor-proof shield. And, when not in use, the otherwise exposed surface of the receptacle is protected by a screw-on cover.

The plug and cable unit, also, is equipped with a shield which threads on in place of the receptacle cover, when the latter is removed.

The industrial employment of explosion-proof electrical equipment, even now, appears to be broadening. In support of this statement, LaVigne Electric, of Miami, Fla., recently made an installation of this kind at an aircraft manufacturing plant.

Here, the problem was to exclude from any electrical contact the inflammable vapors stemming from the use of dope and paint spraying apparatus. The explosion-proof equipment installed included three air compressor motors, 12 plug-in sets of 2 and 3 wire type and 19 lamp fixtures.

These lamps are of different manufacture than those above described. Four conduit hubs are cast integral with the body of the fixture, and are threaded. Any hubs not used may be sealed by means of slotted pipe plugs, 3 of which are furnished with the fixture.

This type has an extra heavy glass globe. The flange supporting the latter is machine fitted to the body of the fixture, and is bolted to it. The metal to metal fit is so close that no gasket is required. A covered opening, which may be resealed, is provided for the connection of feed wires after the fixture is assembled to the conduit.

This equipment is for a plant addition, and represents the second installation of the kind this concern has ordered.

Francis LaVigne, managing partner of LaVigne Electric, which has handled a considerable volume of such work, and his field supervisors, are highly enthusiastic about the safety benefits of explosion-proof devices, where inflammable vapors are present.

Adequate Wiring Campaign Initiated in Baton Rouge

THE Gulf States Utilities Company, of Baton Rouge, La., has taken advantage of a local series of home planning meetings to start a campaign on adequate wiring.

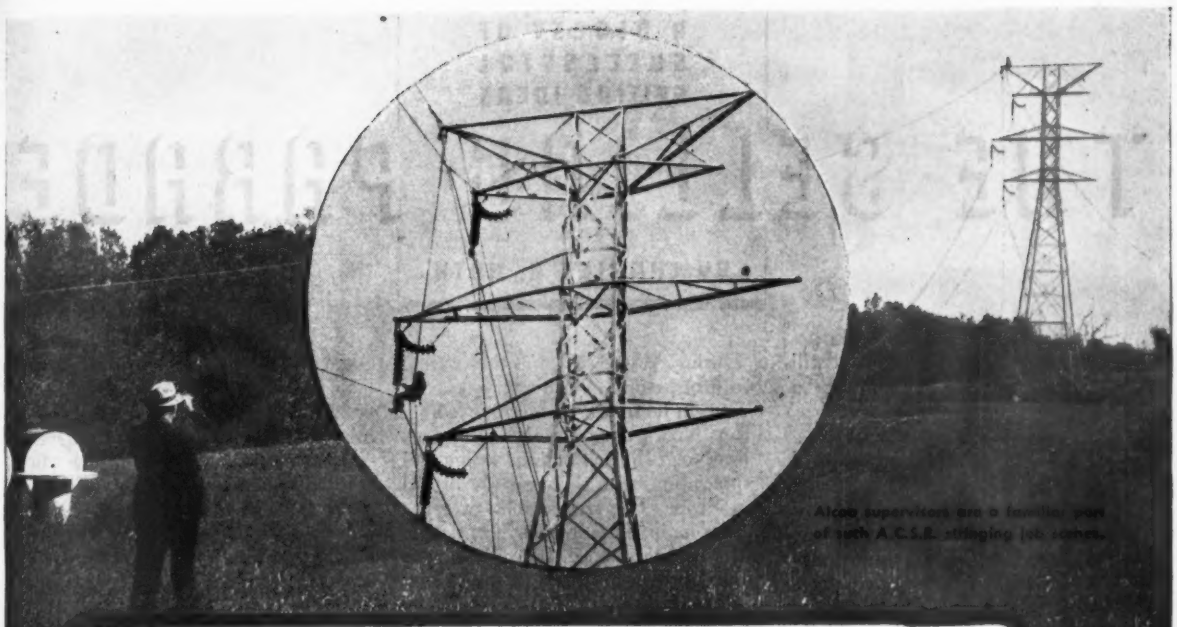
Under the auspices of the Baton Rouge Chamber of Commerce, weekly meetings are being held at which expert builders and architects lecture on the postwar home and stress that it should be planned now.

In the lobby of the Gulf States Utilities Company, the power company has erected a model home and there it distributes publicity on the Chamber of Commerce meetings. Both windows are devoted to adequate wiring advertising and the electric kitchen and laundry of tomorrow.

With the words "Your home depends upon electric service today and tomorrow," company advertising and booklets list the uses for electricity in the home, with the suggestion that the postwar home owner will want door openers, fire alarms, signalling bells, lighted house numbers, door chimes, germicidal lamps, humidifiers, air filters, automatic heat control, garbage disposal, home freezing, and electric toys and tools.

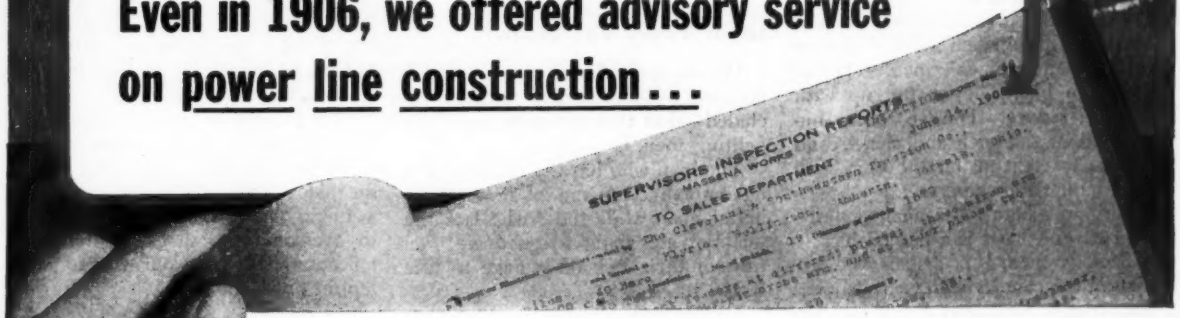
Then in a concise manner they tell in non-technical and understandable terms how the average home should be serviced with three No. 6 wires protected with a 60 ampere circuit breaker. They recommend No. 14 wire on the lighting branch circuits and recommend that each branch serve only 500 square feet of floor area.

The booklet recommends circuits using No. 12 wire for the washer, toaster, ironer, refrigerator, and washer, with three No. 6 or No. 8 wires for the electric range, water heaters, air heaters and air conditioning.



Alcoa supervisors are a familiar part of such A.C.S.R. stringing job scenes.

Even in 1906, we offered advisory service on power line construction...



Note this old report, dated June 14, 1906, covering the erection of 469,600 cm all-aluminum conductors. You see, even before A.C.S.R. was invented, our supervisors were on the job.

The custom has continued throughout all these years. Many line builders like to know that the eye of the cable manufacturer is also on the job. Alcoa's book of knowledge on line construction has grown plump.

By this means, too, Alcoa A.C.S.R. has been kept a leader in its field. Manufacturing and engineering standards have been continually upgraded, a successful system of vibration control developed, and so on.

This advisory service is available to all who plan to use Alcoa A.C.S.R. on their lines. For further information, write ALUMINUM COMPANY OF AMERICA, 2164 Gulf Bldg., Pittsburgh 19, Pennsylvania.

ALCOA

ALCOA A-C-S-R

ALUMINUM CABLE STEEL REINFORCED

A DIGEST OF SUCCESSFUL SELLING IDEAS

THE SELLING PARADE (REGISTERED)

• BY CHARLES B. ROTH

IT'S AN OLD SAW by now but still good. The restaurant put up a sign. It read:

DON'T INSULT OUR WAITERS. WE CAN ALWAYS GET CUSTOMERS.

The trouble is that a good many business men—and salesmen—are comporting themselves as if that were actually true, as if customers would always be a dime a dozen, as if you could push 'em around and get more if they don't like it.

During the past three years of war Americans have taken a lot of beating at the hands of salesmen. They've waited in line. They've put up with inferior service. They've been humiliated by salesmen and clerks. And they've taken it all on the chin with good nature and courage.

But—and here's the main point—they haven't liked it a darned bit.

Secretly there isn't a man or a woman in the country who doesn't resent the arrogant treatment dished out during the past months. People resent for a long time—"They never forget nor forgive a slight," as Lord Chesterfield puts it—and they won't be as sweet when times change and businessmen and salesmen again need customers.

For wise salesmen the present, for that reason, is a grand opportunity to make *lifelong* customers.

These people who have been pushed around will literally fall all over themselves to show appreciation if properly treated. And alliances made now can last right on down through the years.

During World War I there were two firms, equal in size and prospects. Came lush times with easy selling. Firm No. 1 high-hatted customers. Firm No. 2 showed understanding and appreciation, won their friendship and confidence. The second took over the other one in 1926 and has been leader in its field ever since. It's showing the same kind of consideration now that it showed during the last war. There isn't much danger of that firm being a war casualty.

Great Times For Fighters

Whatever else is said about wartime business conditions, this must be included—that they are great times for fighting men.

The man who has the qualities of a fighter will come out of it a bigger, better man, while those who lack the qualities are going to go down, victims of their lack of courage to face facts.

I know two salesmen. Because they represent the two points of view which every salesman in America must adopt, I want to tell you about them.

The war has made a terrific defeatist out of one of these men. He can't get goods for his customers. What's the use of trying any more? says he. How do they expect a guy to sell if he can't see his customers? Is it his fault if the war ruined his business?

The other man, no more able than the first, has reacted in quite a different way.

The other day he told me: "Do you know, there's something stimulating about these times that I never knew in my life before. I've had to change my way of life and thinking entirely. I've been knocked around from pillar to post: last week I stood up in a bus 200 miles. But I've liked every minute of it, because it's made me a better man. I'll be a more appreciative salesman when this is over."

He has the *victor* reaction, while the other man has the *vanquished* reaction.

Whenever I hear salesmen gripe about conditions, I like to think about little old wizened up Voltaire, a 100-pound sprite, who did the work of ten men. He had tuberculosis from early childhood, was always frail. Yet when a friend asked him if he wasn't overworked, he responded: "I carry a tremendous burden *and it charms me.*"

There, I take it, is a victor, a fighting man, speaking, not a defeatist.

They Don't Like Flattery

An intelligent woman I know was indignant the other day when I saw her, though she is usually very collected and calm.

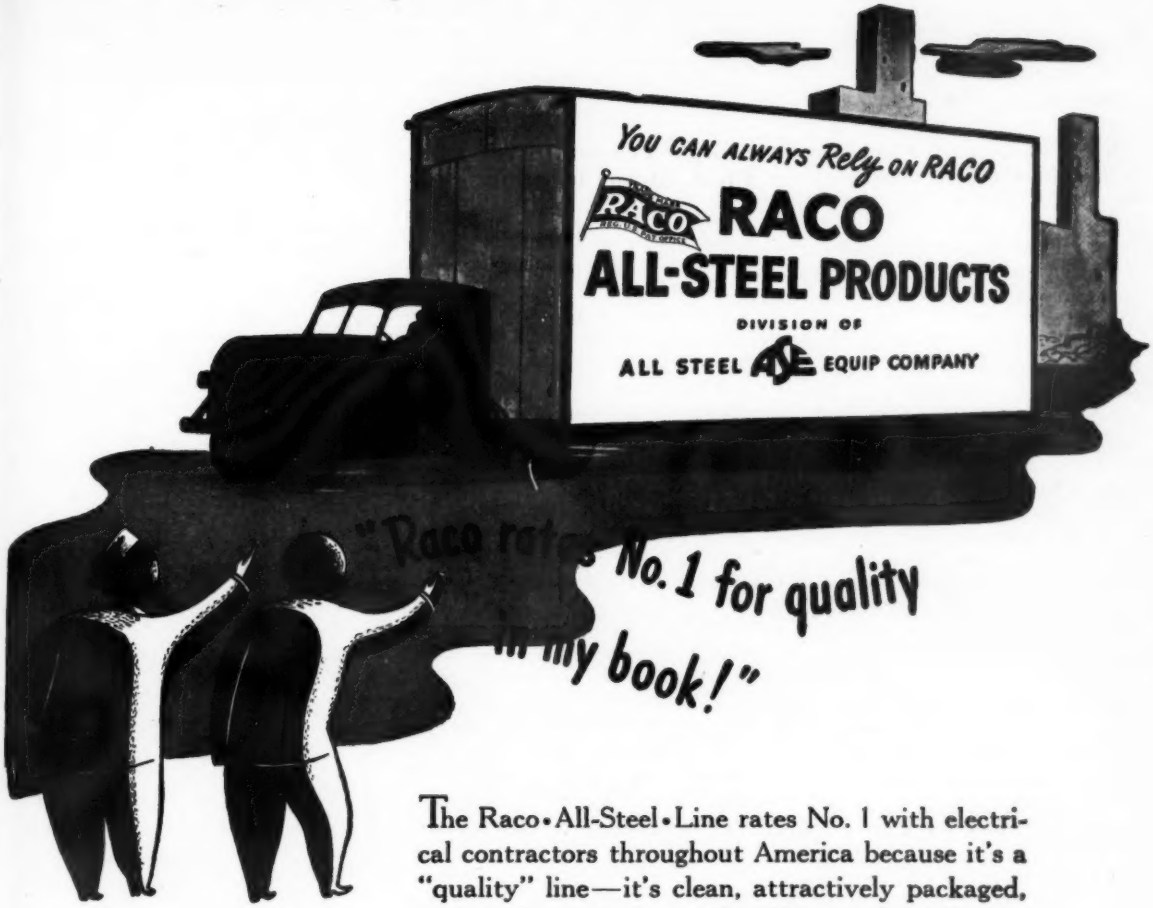
"What went wrong?"

"I'm a victim of poor salesmanship," said she, and explained. She went into a hat store to buy a hat. The effect, she said, was overwhelming: she looked awful in them. While she was trying to overcome the shock of her own reflection, the saleswoman went into raptures over the hats.

"You look just darling in that one," she exclaimed. "It is beautiful."

"Every hat got worse," said the woman, "but every one made her more ebullient. I knew darn well how I looked and so did she, but she was so anxious to make a sale she had hysterics. That made me sore, and I'm still sore."

I knew how she felt. I've felt the same way many times, when I had the feeling that the salesman was not shooting square but was merely trying to get my money. You've had the



The Raco • All-Steel • Line rates No. 1 with electrical contractors throughout America because it's a "quality" line—it's clean, attractively packaged, and trade-marked—it identifies good workmanship, better materials! Accepted by architects and builders, it helps win approval for the contractor's work.

Raco rates No. 1 because it's a dependable line, a complete line. More than 31 years of engineering have kept Raco in step with the latest developments in the electrical field . . . have provided Raco • All-Steel • Products for every type of construction, for old and new building, for repair and maintenance jobs. Be sure—look for the Raco trade-mark. You can always RELY on RACO! It's the better line that is *sold nationally only through wholesalers.*

← DO-25 NJK—*Check this box carefully—for use with* either *BX or Non-metallic. More wiring room.*

CATALOG C-44—*New, up-to-date, see connector chart, comparative Box number chart and other helpful information.* →

ALL-STEEL-EQUIP COMPANY, INC.
800 Kensington Avenue, Aurora, Illinois

RACO • ALL-STEEL • PRODUCTS
SWITCH BOXES • OUTLET BOXES • CONDUIT FITTINGS

same experience yourself. All we can do is not buy from such salesmen.

$5000 From $50

E. St. Elmo Lewis, a famous man in the field of business counseling, has an interesting little story about the cash value of honesty.

In a Pennsylvania community was a Quaker horse dealer. Said a farmer, on seeing one of this man's horses, "Want to sell?"

"Well, I bought this horse for my own use," said the dealer, "but there's no reason why I shouldn't sell him if we can agree on a price."

"How much do you want for him?"

"I paid $150 for him and think I'm entitled to a profit of $50. If you want him for $200, he's yours."

So the deal was made. The horse was delivered and proved to be very satisfactory to the new owner. A few weeks later, however, he received a check for $50 from the dealer and a note which said: "I told you I paid $150 for that horse. On consulting my records I find I was mistaken. I paid only $100 for him. I told you my profit was $50, therefore I am sending you $50 to make the deal right."

The dealer expected no reward for doing what he saw was right according to his lights, but the farmer was so pleased that he told the story over and over again and more than $5000 of new business came to him from the advertising.

The Secret of Selling

Martin M. Hyzer, who lives in Andes, New York, has been an observer of the selling scene for years, and believes that the main secret of selling is a very simple thing. He tells about a shoe salesman to illustrate what the secret is and its simplicity.

This man traveled out of the Chicago district for more than 40 years. He telephoned a prospect to meet him, a prospect he had never seen before. Let the prospect finish:

"Although he had never seen me before, when I walked into the room he took me by the hand, offered me a comfortable chair. There wasn't a sample to be seen. Then he asked me about my wife and family. How did he know that? He asked me other things about my family and business, and although I had never bought from his firm, he knew what I had been buying and what I needed. Before he was through with me he had sold me more shoes than I had ever bought before. He became the most talked-of man in the industry, retired, and now lives in a lovely home in California."

The secret, according to Mr. Hyzer, is simply a sincere, honest, friendly, sympathetic—and helpful—interest in the prospect.

I agree with Mr. Hyzer.

Simple Procedure for Clock Motor Cleaning

One of the electrical appliance trade's most difficult service problems is the cleaning of electrical clocks. For handling this tricky job, G. D. Marple, electrical appliance repair man, of Miami, Fla., has originated a simple but effective technique.

Usually, the clock's operating mechanism is enclosed in a sealed metal container. Unless a new unit can be substituted for one which does not function, appliance men, who will tackle the job at all, generally open the case, and then reseal it, after its mechanism is cleaned and oiled. Marple has found a short cut by doing this work.

With a jeweler's drill he bores a hole about 1/32 of an inch in diameter near one end of the rotor. Introducing the needle of a hypodermic syringe into the bored hole, Marple injects 5 cc's of cleaning fluid. After allowing the latter to remain 5 to 10 minutes, he withdraws it with the syringe, and injects 1 cc. of special clock lubricant. The hole then is sealed with a small drop of solder.

The amount of new oil put in should be carefully measured. Too much will retard the action of the clock's mechanism.

A sizeable percentage of Marple's business consists of clock reconditioning. Many appliance men, he claims, will not do clock work. They regard it as a jeweler's job. On the other hand, clock repair men consider an electric clock as something outside their province. As a result, owners crowd the shop of any appliance man who can, and will, recondition electrical clocks.

Color Code Simplifies Motor Winding Connection

The Electrical Equipment Company, of Miami, Fla., simplifies the winding of motor stators by use of a "color code." The latter consists of sleeving (cotton tubing) in three colors: Red, blue and white. Of a size which fits easily, but not too loosely, over the winding wires, the sleeving indicates by its color what ends are to be connected.

On main (running) windings, white sleeving indicates outside wiring, while red tubing marks inside wires. For starting windings, the code is blue, inside, and white, outside. In either case, white sleeving denotes an outside winding.

On 2-speed motors having 3 or 4 sets of coils, the color combinations are alternated: red and white, then blue and white, and repeat. For series windings, colors are matched. For parallel windings, red and white are hooked up together.

For several years past, the firm has made a practice of hiring and training employees who have had no previous electrical experience. Incidentally, most of these trainees are women. Since inexperienced operators usually have no knowledge of electrical terminology, the employment of this color code plan has proven extremely helpful, not only for teaching purposes, but for getting the actual winding done.

UTILIZING THE NEW MAZDA "SLIMLINE" LAMPS

When peace comes, *Mitchell* will offer a complete line of Longfellow fixtures, using the new MAZDA Slimline Fluorescent Lamps. Fixtures that will be instant starting, that will have no starter to replace. Designed for new grace, flexibility and beauty, the slim new Longfellow is a Poem of Light.

But that is only part of the story, *Mitchell's* Longfellow fixtures will give you many new advantages in creating new and interesting lighting effects.

Mitchell, as always, is conspicuously *first* in introducing new and better lighting equipment. *Mitchell* quality and *Mitchell* design are recognized as unsurpassed in the fields of commercial and industrial lighting equipment.

MITCHELL MANUFACTURING COMPANY, 2525 CLYBOURN AVE., CHICAGO 14, ILL.

WEST COAST FACTORY AND SALES OFFICE, 1019 N. MADISON AVE., LOS ANGELES 27, CAL.

Maintenance Contracts in Essential Industries Turn Wartime Problems into Profits

THE GOING has been tough for most electrical shops in the past few years but for the men who had just entered the appliance business a short time before the war brought an end to appliance manufacturing, the situation has been worse than tough!

By Richard Lane

I realized that there was no use in going after the larger contracts, and yet in order to survive there had to be enough business to justify keeping my six to nine electricians busy," he explains. "Maintenance work, with some emphasis on appliance repairs, was the answer.

"Here's the way I looked at it: The public has a certain amount of essential business that must be taken care of. That business, whether it involves a simple repair of home wiring or the more complex installation and servicing of wiring or switchboards for a large plant or commercial firm, is essential to the home front and more than likely has a direct relationship with the war effort.

"The work is there. Someone has to do it. We're doing it!"

As an example of maintenance work related to the war effort, Baker points to his work for the Auto Sales Co., Inc., which has a large machine shop turning out airplane parts. This shop

Typical of the essential industries among which Dwight W. Baker, of Memphis, has found many profitable maintenance contracts, are those shown here: (left) machine shop engaged in war work; (below) storage rooms of the National Produce Co., where Mr. Baker, at left, looks over his work with W. A. Lavelle, of the produce company.

When one of these newly organized companies not only stays in business, but shows substantial growth through maintenance contracts, appliance servicing, and wiring, their operations deserve careful study.

Dwight W. Baker, of Memphis, Tennessee, is such an operator. His place of business at 1112 Union Avenue is considered one of the busiest and most enterprising of its kind in the Bluff City. And the company is looking forward to the postwar period with some big ideas in mind.

Baker, who came up the electrical success ladder the hard way, attributes most of his success to hard and efficient work, especially on maintenance contracts that have kept commercial firms and industries operating smoothly during the war.

"Being a fairly young firm when the war started and priorities came along,

THERE IS A SQUARE D *Circuit Breaker* FOR EVERY TYPE OF INDUSTRIAL APPLICATION

Rain-tight Multi-breakers with a variety of circuit arrangements for such outdoor applications as lights, signs, etc. Also Multi-breakers and circuit breakers in weather and dust-tight and explosion-resisting enclosures.

Industrial Multi-breakers are available in capacities from 15 to 100 amperes, with 2 or 3 poles. Quick make, quick break with dust-resisting sheet steel enclosures; also, explosion-resisting types. Front operated with trip indication.

Weatherproof, Dust-tight and Explosion-Resisting Circuit Breakers are furnished in cast iron enclosures with gray enamel finish. Standard conduit openings in the ends. Capacities—15 to 600 amperes up to 575 Volts.

Multi-breaker Type M Load Centers with 50 ampere frame breakers for applications involving 120-240 volt AC circuits. Available with varied number of single and double pole breakers of 15-20-25-35 and 50 ampere ratings. 100 ampere bussed mains available if required. Choice of surface or flush mounting devices for indoor installations and raintight boxes for outdoor applications.

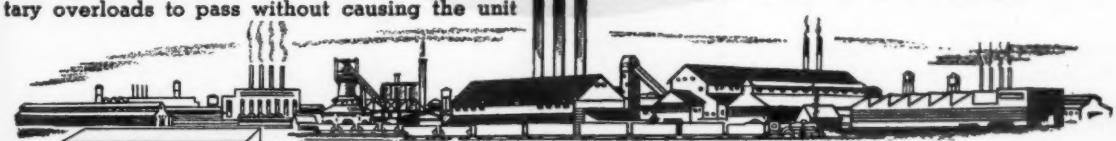
MO Multi-breaker for use on small machines such as drill presses, grinders, riveters, staplers, saws, beaters, etc. Available in single and double pole or for 2 and 3-wire systems. 15, 20 and 25 amperes. Price is comparable to Type D switches.

Industrial Circuit Breakers in standard sheet steel enclosures are available in capacities from 15 amperes to 600 amperes, up to 575 Volts. Made in 2 and 3 poles and for 3 and 4-wire systems. These devices are quick make and quick break with trip indication.

Multi-breaker Load Centers for controlling and protecting lighting and small power circuits. Made in a variety of circuit arrangements with capacities of 15, 20, 25, 35 and 50 amperes, for either 2 or 3-wire service, with individual trip.

Multi-breaker Load Centers in Cast Iron Enclosures for Class I, Group D and lower applications. Can be furnished for 2 and 3 wire solid neutral systems—up to 8 single pole circuits or combination of single and double pole. These cast enclosed Multi-breakers enjoy a wide variety of applications wherever explosive atmospheres exist.

• **Square D Circuit Breakers** provide quick restoration of service after short circuit or overloads. They eliminate fuses and reduce maintenance cost since no replacement of parts is necessary. • Built into every Square D circuit breaker is a time-lag feature which permits harmless momentary overloads to pass without causing the unit to disconnect the circuit. • Square D's line of circuit breakers is unusually complete, assuring the right unit for any given installation. • See our catalog in Sweet's or write for Industrial Circuit Breaker Bulletin. Address Square D Company, 6060 Rivard Street, Detroit 11, Michigan.



SQUARE D COMPANY

DETROIT • MILWAUKEE • LOS ANGELES

Baker's service work requires the manufacture of bearings and other scarce parts. Here one of his operators turns a small part on a lathe.

calls for periodic service on precision machines.

Then there is another type of essential customer. The National Produce Co., which does a huge poultry business for the public and some of the armed forces in the South, has a great deal of electrical maintenance work because of its poultry dressing equipment and storage facilities.

It's a cold business but also a steady and profitable one for Baker. Often his electricians must work in National Products Co. storage rooms kept at freezing temperature.

With the increased demand for repairing of all types of household appliances, Baker has expanded his shop and plans to go into this part of the electrical business on an even larger scale after the war. The company's lathe has enabled it to make bearings and many parts now almost impossible to buy and at the same time it speeds up repairs.

With the advent of peace, Baker is going to take on a complete line of small appliances and also put in a line of heavy duty appliances, such as electric refrigerators, attic fans and ventilators. The company also will specialize in making special ventilating equipment where it is not available at the factory.

Baker has made some large ventilating fans himself during the past several years, but declares he has done so more for the novelty of it and has no intention of making it a business. He sees a terrific boom for this type fan after the war but prefers to leave the manufacturing of ventilators to the big concerns because of the small margin of profit in turning them out on a limited scale. He expects to increase his servicing of ventilators, however.

"We have specialized more in the installation of ventilating fans the last few years and are looking forward to a great deal more of this type work after the war," Baker says. "There is a good market for such fans now, but the ventilators we have made have been for a few customers who needed them enough to pay for a special job.

"Frankly, I don't intend to go into the manufacturing end of the ventilator business because I have found that an independent, small shop simply can't build them as cheaply and as well as the big companies. I don't recommend any small shop trying to make and sell them for a profit. Customers who think they are getting something for almost nothing when they have a ventilator built to order in a small shop are running into false economy and possibly grief later on, too, because such fans simply can't compete with a precision job turned out by a large concern."

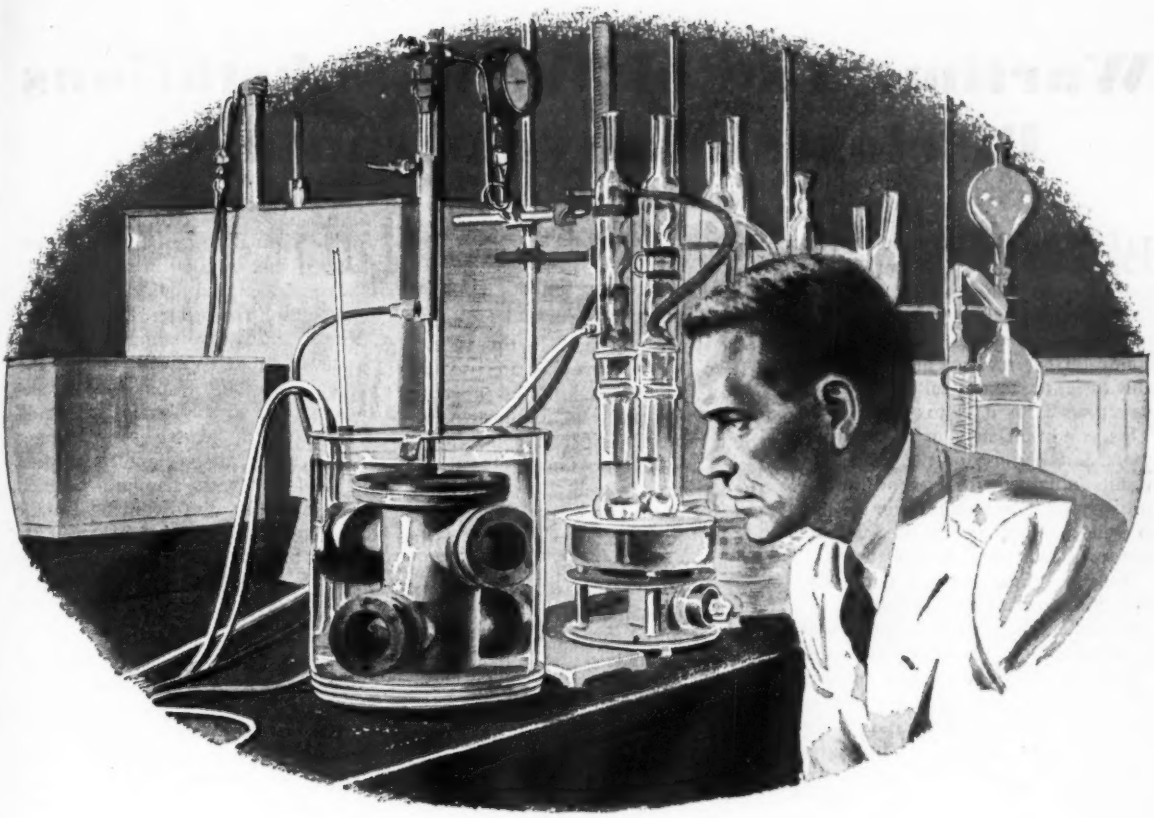
One of Baker's postwar plans concerns more house wiring and he is getting ready for it now. When the pent-up demand for new houses is turned loose, there is going to be a lot of business for Baker because of the good will the company has steadily built up through the war by its maintenance and repair work. A Baker customer now is a Baker customer tomorrow, he feels sure.

Baker especially sees more fluorescent lighting on the way. There will be many improvements, too, with range receptacles and more and better outlets. It all will add up to more electrical work per job and there will be more jobs.

While some home designers are being carried away by the prospect of ultra-modern, electrically-run homes in the postwar era, Baker doesn't see it that way, but he is quick to admit that

(Continued on page 64)

The appliance repair department has been a profitable operation and Baker is planning to expand this part of the business after the war.



How will this "Soxhlet" help give Frigidaire Dealers still better products to sell?

FEW PEOPLE have ever seen this "Pressure Soxhlet," a unique instrument developed by Frigidaire Research Engineers. It's used to "turn a refrigerator mechanism inside out" . . . to examine every part and material of a mechanism . . . to see what happens through a "lifetime" of operation.

The "Soxhlet" is only one demonstration of that spirit of creative research which has spurred Frigidaire Engineers on to new leadership — year after year.

Proof of this Engineering leadership is in all the major advancements Frigidaire has contributed to make modern refrigerators so convenient, dependable, and economical!

To name only a few —

Frigidaire and General Motors pooled their scientific knowledge to develop "Freon," the world's first and only *safe* refrigerant.

Frigidaire led the way to better refrigeration of fruits and vegetables with the Hydrator . . . provided temperature regulation, sped ice freezing, simplified dessert making, with the Cold Control . . . offered the first Frozen Storage Compartment.

Frigidaire was first to provide trigger-quick ice cube release, with its celebrated Quickube Tray and Automatic Tray Release.

Frigidaire set new standards of performance and economy with its famed Meter-Miser, the simplest refrigerating mechanism ever built!

Frigidaire opened an entirely new era of more efficient, more convenient food preservation with the development of the Cold-Wall refrigerator.

And these are only a few examples of the Engineering leadership that has helped Frigidaire Dealers maintain consistent *selling leadership!*

It also provides the Frigidaire Dealer with the strongest assurance of product and selling leadership in the future. He *knows* that he will be able to offer his customers the kind of advanced refrigerators, electric ranges and other appliances that they are expecting. *He knows* that he will be able to take fullest advantage of the great selling opportunities that lie ahead. *He knows* Frigidaire Engineering will always provide better *and better* products for Frigidaire Dealers to sell.

3 Reasons for Frigidaire Engineering Leadership

1—Frigidaire maintains a *complete* Research-Engineering Organization, an organization skilled in not just one or two sciences, but in *all* the sciences concerned in the products it manufactures—chemistry, electricity, mechanics, metallurgy, ceramics, and the rest.

2—Frigidaire Research is never satisfied. Long before a product reaches Frigidaire Dealers and the public, Frigidaire Engineers are searching for ways to make it better.

3—Frigidaire Engineering is backed by the tremendous resources of General Motors.

Look to Frigidaire for Leadership through Engineering!

Wartime Use of Wood Substations Discloses Many Advantages

By J. A. Rawls*

BEGINNING a few months prior to the start of the war and up until a short while ago, it was practically impossible to secure steel for substation structures. Recently this condition has reversed and it is probably easier to secure steel for substation structures than it is to secure wood. This condition may exist for a few years, but because of the satisfactory results obtained from wood for the use of substation structures in the past, it will undoubtedly be used for this purpose again when it is available.

On the system of the Virginia Electric and Power Company major substations have been constructed by using a combination of wood and steel. These structures in general consisted of creosoted pine poles for the uprights and galvanized steel trusses for the horizontal members running between poles. These steel trusses were used where the spans were relatively long and timbers to give the desired strength would have been large and bulky.

Small substations on this system have been constructed wholly of wood for several years with very satisfactory results. Wherever good creosoted pine poles and timbers were used in the station construction, every indication is that the life of the station will be from twenty to thirty years. In fact, we find that increase in load growth, changing in location of the load or obsolescence makes it necessary or desirable to either move or relocate small stations before they have served their useful life. If the station is of wood, we do not hesitate to construct a new one to fit in with the new equipment and location, whereas if the station is steel, we try to use it over again and it seldom lends itself to the new location or equipment.

Two Types of Wood Structures

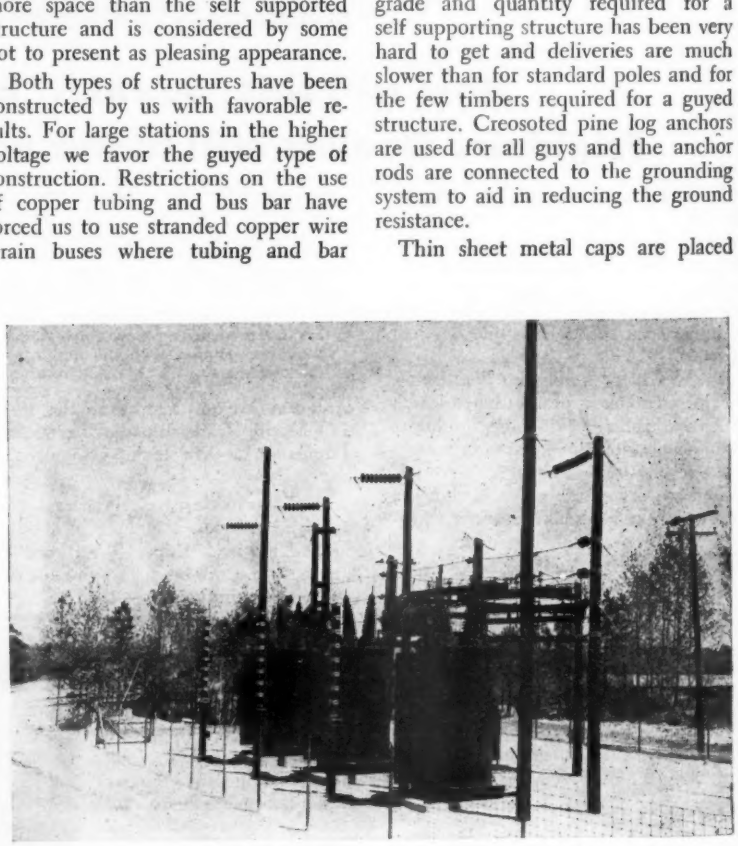
As we see it, there are two distinct types of wood substations, one which is braced and completely self supporting like a steel structure, and the other which depends on guys for its strength. Much less timber is required for the latter type and the timber that is required does not have to be of such good structural grade. In this type of station, the timbers that are used are bolted without metal fittings directly to poles which are used for uprights. In the completely self-supporting station, sawed timbers are normally used for the uprights, as well as for all bracing. Good structural grade timber should be used for all bracing and it is better to fasten this bracing to the uprights with metal fittings. This type of structure is not guyed, but the weight of steel required for the metal fittings will approximate the steel required for guying in most stations. The cost of erecting this type of structure is generally greater than for the guyed type. Of course, the guyed station requires more space than the self supported structure and is considered by some not to present as pleasing appearance.

Both types of structures have been constructed by us with favorable results. For large stations in the higher voltage we favor the guyed type of construction. Restrictions on the use of copper tubing and bus bar have forced us to use stranded copper wire strain buses where tubing and bar would normally be used. Where stranded wire of 1000 mcm or smaller is adequate, we feel that in many cases it is better than tubing or bar.

Strain insulators which have mechanical strengths well above the standard pedestal or pin type insulators are used for the stranded bus, allowing much greater short circuit stresses than can be handled on tubing and bar with standard pedestal insulators. The use of guying for the structure lends itself very well to strain buses, particularly so when buses with vertical arrangement are used which dead end onto two poles that are guyed back.

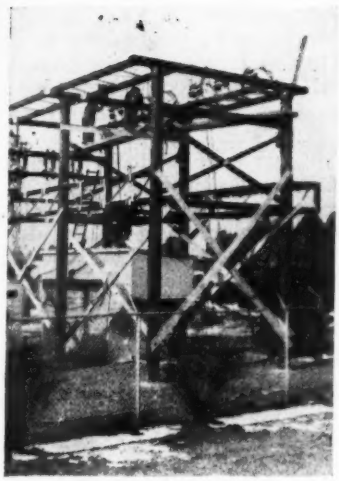
In constructing self supporting wood structure, we have made up the necessary metal fittings from scrap steel in our own shop and had them galvanized locally. The timber in the grade and quantity required for a self supporting structure has been very hard to get and deliveries are much slower than for standard poles and for the few timbers required for a guyed structure. Creosoted pine log anchors are used for all guys and the anchor rods are connected to the grounding system to aid in reducing the ground resistance.

Thin sheet metal caps are placed



Virginia Electric and Power Company 110-kv wood substation with guys.

*Senior Engineer, Virginia Electric and Power Co., Richmond, Va.



Typical braced wood structure.

over the tops of vertical poles and timbers in substation construction in an effort to increase the life of the structure. Our experience has indicated that the tops of creosoted pine poles rot out before signs of decay show up at any other place.

In some cases advantage is taken of the wood to add electrical strength but in the majority of the cases it is better to treat the structure as if it were steel, particularly if transformers or regulators are present so as not to allow excessive high voltage to be built up at the station. Our safety rules require that most substation equipment be grounded, which makes it necessary to by-pass the majority of the wood members with a ground connection.

In some recent substation designs, we have used creosoted pine poles from stock for the uprights, along with standard creosoted wood crossarms from stock as the horizontal members. Of course, when material is used from stock, it is necessary to drill and gain in the field, thus reducing the effectiveness of the treatment. When timber is fabricated in the field, after treatment, the fabricated places are given a treatment of hot creosote oil. We normally make detailed drawings for each wood member in a wood structure with as much accuracy as would be used if a steel structure were being designed. We found that the timber suppliers were not particularly accurate in fabricating the timbers from the drawings, but we have learned how to make the drawings with dimensions in the language that they use and we do not anticipate any trouble in the future. Creosoted timbers have been used for constructing all of the recent wood stations on our system and while they cannot be satisfactorily painted, we do not find their appearance objectionable. Other timber treatments are available which lend readily to painting.

We feel that wood stations have the required life under present timber preservation methods. They lend themselves more readily to changes and additions, and are more reasonable in cost than steel structures, and for these reasons, we feel that wood structures will be used on many power company systems after the war is over and when steel is readily available again.

Industry's Next Big Problem--Finding Jobs for Veterans

WITHOUT a doubt, the biggest job that industry will have in the next two or three years is to provide jobs for all, and the returning service men are to have preference in this respect.

More than a thousand men per week are now returning with honorable discharges from the armed services. This rate of return will undoubtedly increase rapidly when the war with Germany is over.

Now is a good time for every supervisor to gain experience in the proper handling of returning service men while the rate of their return is low.

Once a service man is back on the job, the supervisor should become his best friend and counselor. No one will have more to do with helping service men get a new start than supervisors.

More and more the men who return will be men who have been through a great many harrowing experiences. They will need to "get in step" once more with civilian life—with life on the job. Some of these adjustments may be difficult. The constant friendly advice and guidance of a supervisor will make all the difference in the world.

Getting the Veterans Started

It is good to have the returning veteran feel that he is getting fair consideration. He should be treated with courtesy, and appreciation. Your first interview with him should be thorough and sympathetic, but be sure not to overdo the sympathy. The veteran does not want to be "babied." He does want a good square deal.

If a veteran is physically handicapped, assign him to a job that does not call for physical capacities he no longer possesses. If you place him on the right job, he need not be regarded as handicapped. The worst thing to do is to put a handicapped veteran on a job which he cannot do efficiently and then tell him, "I know you can't do a full day's work on this job, but we will be glad to overlook that and won't expect full results from you."

Placed on the right job, the disabled veteran can earn his full pay and maintain his self-respect.

First Weeks Most Important

The very first few weeks are the most critical period for the veteran in making his adjustment to a job. The supervisor can play a most important part in aiding him in this adjustment. The veteran's job is the most important factor in his readjustment to normal life.

Every supervisor should thoroughly understand his company policy regarding the hiring of veterans and dealing with them after they have been placed on the payroll. The supervisor's first duty is to make the veteran feel at ease. Find out the kind of an assignment the veteran had in his military service. These facts will be of great value in placing him on the proper job and in getting him adapted to it quickly and easily.

Inform the returned veteran of any changes in policies or practices which have occurred since he left. Instruct him on any new methods which have been adopted. Consult with him frequently and follow him closely so that you know he is getting off to a good start.

Encourage him to ask questions and to seek help from you. Be sure that he has every possible advantage of correct information and proper training. Keep such close daily contact with the veteran that he will feel that he can bring his personal problems to you. Watch him very closely for any feeling of dissastisfaction or inadequacy.

Remember, these are the boys who have helped to maintain our freedom. Our greatest service to them is to give them an opportunity to make good on a good job.

(Management information published by Elliott Service Co., N.Y.C.)

Hay Drying Plants Promoted by Utility

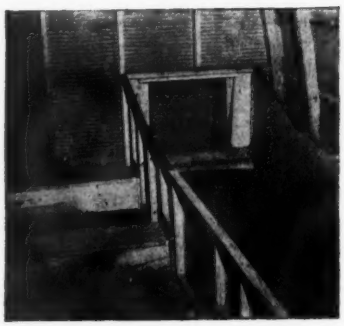
THE ELECTRIFICATION of farms is one of the postwar "musts" that has only been held up because of war necessity. But in spite of the curtailment of highlines and such essentials as electric motors, many utility companies have made progress in this field by helping farmers and stockmen meet the manpower shortage by doing their labor electrically and by taking care of their farm products in such a way as to command better prices. Such a program has made very good progress for the Houston Lighting and Power Company, in Houston, Texas.

Hay and grain drying plants, some from improvised materials, have been installed in a number of Gulf Coast counties under the supervision or by the suggestion of the Houston Lighting and Power Company's representatives working in cooperation with county agents and others interested in improving quality and prices for farm crops.

The average price for installing a hay and grain drying system in the Harris County vicinity, in Texas, has been about $250 to $275, while the cost for drying peanuts, grain sorghums such as milo, and other such crops is about $1.72 per ton. One farmer, near Houston, for example has installed a drying system in a 16 by 32 foot barn that will hold 30 tons of hay. The cost of the system was $35 for lumber to build a header, which is a long enclosed box or chute running down the side of the barn wall for the hot air passage. Branching off from this header are smaller wooden laterals that permits the hot air to flow through them across the floor of the barn where hay is piled. The labor for building the header and laterals totaled $15, the butane gas burner was $22.50, and the multivane fan cost $100. A portable 5 horsepower motor used for operating a hammermill, and other farm operations can operate this blower to carry the hot air through the channels for drying hay in from one to three days.

Peanut hay in this and similar barns of the vicinity with drying systems cures out in less than three days with the peanuts ready to thresh and the hay all barn cured and ready for baling. This barn cured hay means no loss to storms and is all bright and usable, grading U. S. No. 1 for 49% of the hay and a good quality for all the hay, while field cured hay has none of its grading U. S. No. 1, and more than 56% grading less than U. S. No. 3.

Although there have been a number of large commercial drying plants for rice built in the Gulf Coast section involving an investment for each plant ranging from $50,000 to $150,000 each for drying and warehousing rice until it is ready for shipment, a number of farmers are turning to these small drying plants for sacked rice, peanuts, grain sorghums, and hay of various kinds.



A butane gas burner and multivane fan, shown below, supplies the hot air to the duct system across the barn floor (see above). The hot air passing up through the hay, grain, or peanuts, cures the product and greatly increases its value.

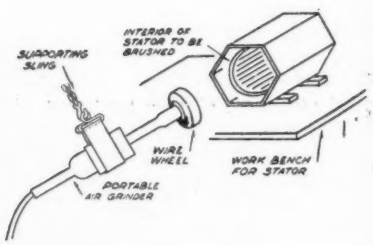
Motor Driven Brushes Speed Stator Cleaning

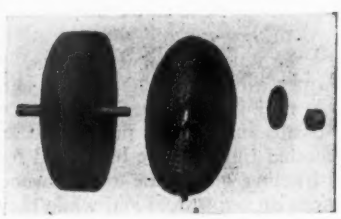
MANUFACTURERS of critically-needed electric motors are making many uses of power brushing to maintain production for the armed services as is exemplified by one of the nation's largest manufacturers of electrical equipment.

One of the interesting applications is in cleaning insulating varnish from the interiors of stators, according to a report received by the Osborn Manufacturing Company, Cleveland, world's largest producer of brushes for industry.

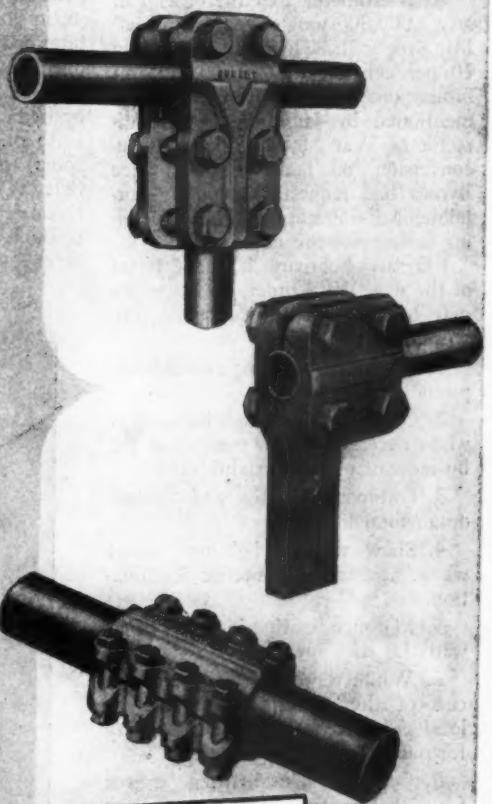
Usually stators are not dipped—only the coils. The electrical equipment manufacturer has been using power brushing for the usual operations in removing insulating varnish as well as for other work. Other typical jobs for power brushing in making electric motors include removing small fins in slots of stators, rust and discoloration from hardened steel rotors, burrs and

(Continued on page 64)





NEW - a complete line of ALUMINUM POWER CONNECTORS



made of an heat-treated aluminum alloy, high in tensile-strength, elongation, conductivity!

Keeping constantly abreast of utility connecting requirements, Burndy now supplies aluminum connectors for connecting aluminum conductors, or aluminum to copper . . , *in sizes and types for all power needs.*

This new Burndy line is made of a specially selected heat-treated aluminum alloy which combines *high tensile strength, high conductivity,* and *high elongation.* This latter property overcomes embrittlement; permitting the connector to conform tightly to the conductor without danger of cracking.

The design of each connector, too, has been determined through long, rigorous testing in the thorough Burndy way . . . to assure the proportioning essential for *enduring high joint pressure* in service.

If aluminum has a place in your future sub-station plans, let us consult with you regarding these new aluminum connectors. Communicate with the Burndy representative near you, or write to connector headquarters. Burndy Engineering Co., Inc., 107H Bruckner Blvd., New York 54, N. Y.

Headquarters for CONNECTORS

Burndy

NEWS of the INDUSTRY
National and Southern

ELECTRICITY ELIMINATED FOR OUTDOOR ADVERTISING

J. A. Krug, chairman of the War Production Board, recently announced a nation-wide "brownout" order effective February 1, 1945, prohibiting certain specified types of electric lighting as one phase of the program to alleviate the critical fuel shortage.

Utilities Order U-9, the new restriction, virtually eliminates use of electricity for outdoor advertising, ornamental and display lighting.

"It is estimated that the order will save 2,000,000 tons of coal annually," Mr. Krug said. "This is approximately 10 per cent of the 25,000,000 ton bituminous coal conservation goal mentioned by James F. Byrnes, director of War Mobilization and Reconversion, on January 10." Justice Byrnes had requested voluntary curtailment of unnecessary lighting, pending issuance of this order.

Effective February 1 under terms of the new WPB order, no electricity may be used for the following purposes:

1. Outdoor advertising and outdoor promotional lighting.

2. Outdoor display lighting, except where necessary for the conduct of the business of outdoor establishments.

3. Outdoor decorative and outdoor ornamental lighting.

4. Show window lighting, except where necessary for interior illumination.

5. Marquee lighting in excess of 60 watts for each marquee.

6. White way street lighting is excess of the amount determined by local public authority to be necessary for public safety.

7. Outdoor sign lighting, except for: (a) Directional or identification signs required for fire and police protection, traffic control, transportation terminals or hospitals, or directional or identification signs for any similar essential public services the lighting of which is specifically certified to be necessary by local public authority. Certification shall be made in writing to the appropriate electric supplier and need not be in any particular form. (b) Directional or identification signs using not more than 60 watts per establishment, for doctors and for hotels, and other public lodging establishments.

Mr. Krug announced that Edward Falck, director of the WPB's Office of War Utilities, will administer the order.

The order is effective throughout the nation. Provision is made, however, for the Office of War Utilities to exempt from the order's terms any section of the country where it is determined that compliance will not reduce the consumption of coal or other scarce fuels. (Example—power supplied by hydro-electric stations.)

As one of the penalties for noncompliance, the new order provides that WPB may direct the discontinuance of electric service to any consumer who willfully violates the order.

WPB also appealed for maximum conservation in all uses of electricity that are not prohibited by the order and said that "the electric industry of the nation, both public and private, has pledged its wholehearted cooperation in support of the fuel conservation program announced by Justice Byrnes."

FRIGIDAIRE VISO-TRAINER HELPS SERVICE TRAINEES

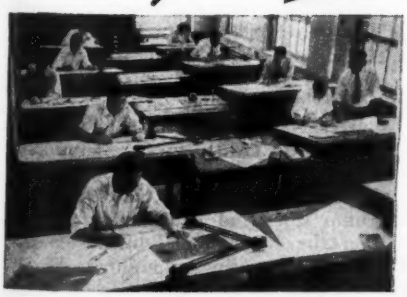
The Frigidaire "Viso-Trainer" has been developed to assist in demonstrating the proper methods of servicing Frigidaire refrigeration equipment, and it is based upon a device used for several years in Frigidaire Factory Service Training. The "Viso-Trainer" is now being used in all of Frigidaire's Advanced Training Schools and has proved itself an unusually successful training medium. Field servicemen claim it is contributing ma-

Herman F. Lehman, Frigidaire's general sales manager, General Motors Corporation, is discussing the Frigidaire "Viso-Trainer" with the following men who are left to right: George Reed, service manager of the Baltimore Branch; Frank Rice, commercial and air-conditioning manager of New York Branch; R. H. Huston, manager eastern region; T. A. Arminio, comptroller and assistant branch manager of the New York Branch.

$1,000,000 WORTH OF *New Design*

As a part of Universal's own "U" Plan for "V" Day, a million dollars is being expended at the plant to redesign the entire Universal line. Under inspired leadership, an expert staff working in six laboratories is applying extensive research to consumer needs. Skilled designers are combining their talents with those of several of the country's outstanding product design groups...streamlining models for sales appeal...simplifying construction for greater utility... adding new features to meet tomorrow's demands for better living.

WHAT IT MEANS TO YOU!



Universal's reputation has been built primarily on quality, but in the coming competitive period dealers will need not only quality but smartness of design, unique features and new products to broaden markets and increase profits. We guarantee that Universal quality will be maintained. Those who have previewed Universal's post-war products are certain the million dollars for new design is being well spent... forecasting appliance leadership for Universal distributors and dealers.

Add to these factors three million dollars worth of new manufacturing facilities, fifty million customers worth of good will and you gain some idea of the true value of the Universal franchise in your community. *Write or call your nearest Universal distributor for full franchise information. Plan today to join Universal's "Forward March to Market".*

UNIVERSAL

LANDERS FRARY & CLARK • NEW BRITAIN • CONNECTICUT

Universal Electrical Appliances distributed in Canada exclusively by Northern Electric Company, Ltd.

terially to the service educational program going on at the present time.

This "Viso-Trainer" consists of a section of transparent bent glass tubing representative of the copper tubing used in an evaporator or cooling unit. The various gauges and thermometers necessary for testing can be installed for the visual class reading. A connection is provided so that many types of household and commercial refrigerant control valves and restrictors can be hooked into the apparatus.

By operating these valves either manually or automatically, actual refrigerant can be passed into the glass tubing, thereby showing students the exact appearance, movement, and results of liquid refrigerant and its conversion into a vapor. Thus, the functioning of various valves and the action of refrigerants are clearly demonstrated as they actually occur in a Frigidaire freezer or cooling unit. By this means, typical service conditions and problems are duplicated before the students' eyes, and they are shown in a way that they cannot easily forget how such difficulties as oil logging, shortage of refrigerant, excess refrigerant, line restrictions, etc., are caused and can be corrected.

CROSLEY ANNOUNCES GEORGIA DISTRIBUTOR

Appointment of the Georgia Appliance Company as distributor for the Crosley Corporation in most of the state of Georgia has been announced by E. C. Brode, manager of distribution, the Crosley Corporation.

The Georgia Appliance Company is a newly-formed firm in which P. C. Gilham, Jr., and Herndon Thomas are partners. The firm is located at 553-55 Whitehall Street, S. W., in Atlanta where it operates a service department and a radio parts general replacement department, under the management of R. H. Huey.

Mr. Gilham is also head of another firm engaged in the wholesale electric supply and appliance business. For the past ten years, he has been widely known in the electric field. Mr. Thomas has been the head of the appliance division of one of Atlanta's largest electric distributors for the past twelve years and is widely known in the electric appliance trade throughout the state.

ALUMINUM INDUSTRY GOES OVER THE TOP

The aluminum industry in 1944 went far enough "over the top" in supplying war needs of the United States and its allies to permit WPB to close down entirely a number of government owned aluminum plants, releasing thousands of workers to shell producing plants and other critical industries which need them badly for the final, all-out victory drive.

Even with substantial concurrent reduction in Alcoa's production, aluminum is still being made in this country at a rate three times that of the peacetime peak. During 1944, ever-increasing quantities of the metal poured into new military applications. Because of its availability, aluminum was not only returned to those military uses for which other materials had been substituted, but was, itself, substituted in many cases for other materials less plentiful in supply. The new year should see growing amounts of aluminum going into the semi-military and civilian uses which must be expanded as rapidly as manpower may be safely diverted to their development.

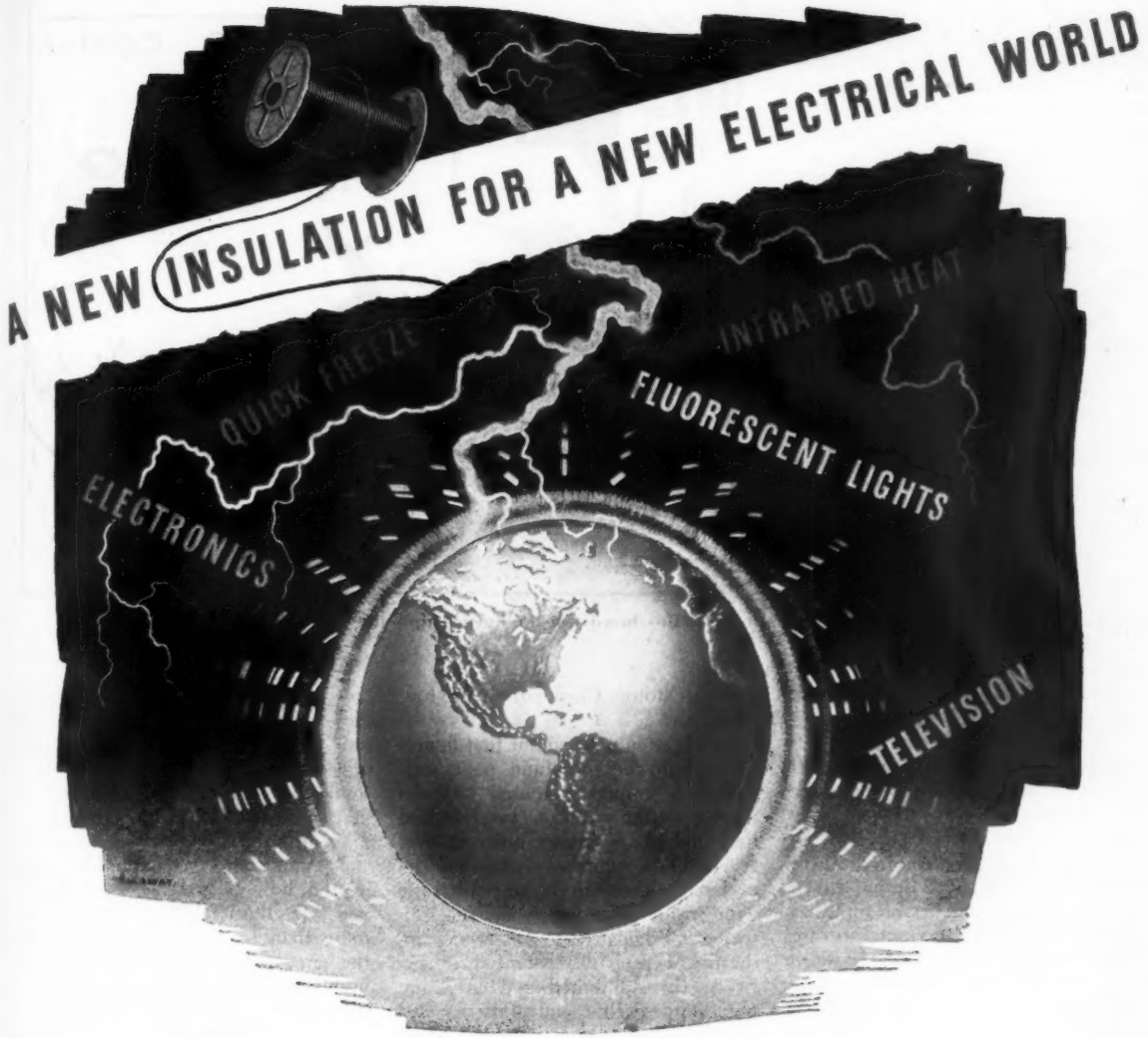
Prime examples of semi-military uses are airplane mats weighing about half as much as the older steel type, and aluminum drums weighing 21 pounds as compared with 52 pounds for those of other materials. These light drums enable our Air Transport Command to deliver each month hundreds of thousands of extra gallons of fuel "over the Hump" to China. Typical of civilian uses are aluminum hopper cars ordered by Missouri Pacific Railroad, a hopper car with aluminum sides and ends already in use on the Burlington Railroad, and a most interesting aluminum boxcar just completed for service on the Great Northern Railroad. Wherever possible, surplus aluminum stock left in military stores, has been utilized. A quantity of aluminum sheet belonging to the Army was recently turned over to the Navy for use as siding and roofing in the construction of Navy warehouses thereby saving other more critical materials.

Aluminum manufacturers during 1944 developed a number of new al-

ELECTRIC BLANKETS FOR ARMY AIR FORCE

The 300,000th electrically heated suit produced by General Electric for the Army Air Forces is held here by Virginia Mayo, Samuel Goldwyn star, at the General Electric exhibit at the NRDGA Convention, at the Hotel Pennsylvania. Research which made possible General Electric production of more than 2,250,000 units of electrically heated clothing and equipment for the Army Air Forces will contribute to a new improved G.E. automatic blanket which will set new standards of sleeping comfort for civilians after the war, according to David Spooner, Jr., manager of the Pioneer Products Division.

Also on display was the new G.E. casualty blanket, a new kind of automatic electric blanket, which is to be standard equipment on bombers. Other features of the G.E. display included samples of flyers' suits, shoes, gloves, oxygen mask protectors, machine gun covers, camera filter protectors, and electrically heated goggles.



nubun

Tomorrow's world will witness countless new home benefits from electricity. In the kitchen, new quick-freeze refrigerators and new infra-red, deep-heat stoves—throughout your house, new high-frequency lighting, new FM and television radios. And to deliver electricity for this, not the ordinary wire of today, ***but a new wire, with new and higher electrical standards will be required.***

Scientists have pioneered a better insulation for just such a wire. Through research that stems from the rubber molecule itself, and through precise methods of production, United States Rubber Company has developed Nubun...a new buna rubber insulation, flexible, moisture-resistant, tough—safe. Nubun is applied by the unique dipped process that permits perfect centering of the wire and a diameter smaller than any now commercially available.

Serving Through Science

Listen to "Science Looks Forward"—new series of talks by the great scientists of America—on the Philharmonic-Symphony program. CBS network, Sunday afternoon 3:00 to 4:30 E.W.T.

UNITED STATES RUBBER COMPANY

1230 Sixth Avenue, Rockefeller Center, New York 20, N. Y. • *In Canada:* Dominion Rubber Co., Ltd.

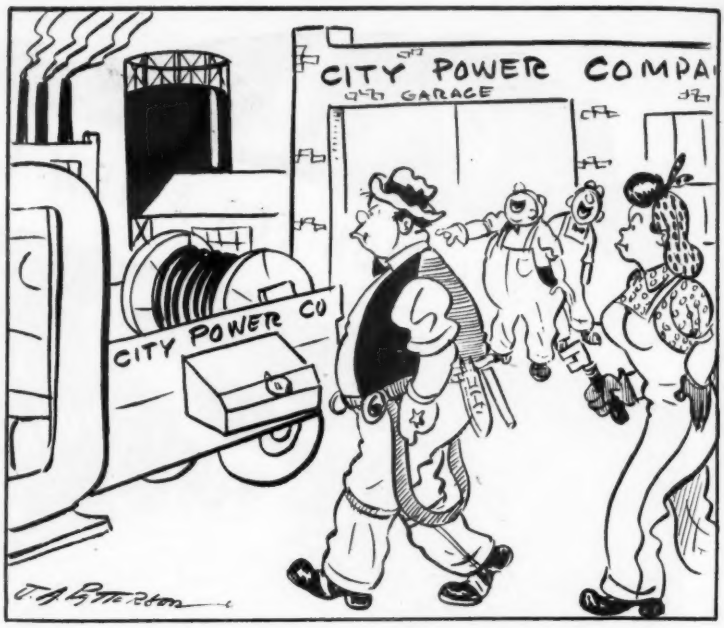
loys of military importance and of far-reaching peacetime significance. A new Alcoa alloy, 75S, has a yield strength about twice that of the strong aluminum alloys used only a few years ago, and an ultimate strength exceeding 80,000 pounds per square inch.

To help offset the shortage of high-grade domestic ores for the production of aluminum, Aluminum Company of America research laboratories completed and put into commercial operation a process which successfully uses a much lower grade ore. By the use of this Alcoa combination process which should have great future significance, a sintering operation is combined with the standard Bayer process for obtaining alumina (aluminum oxide) from bauxite and other aluminum-bearing ores. The new process is the result of a quarter century of research and makes possible the use of low-grade ores which were considered of little commercial value before the war. A new alumina development laboratory to develop further improvements in the operating technique of this new process has just been completed at the East St. Louis Works of Aluminum Company of America. The equipment in the laboratory is arranged so that it can be connected into complete systems for any alkaline digestion or sinter process, or combination of these processes, to handle any type of raw material.

To meet urgent civilian demands for aluminum, WPB issued during the latter half of 1944, a series of authorizations for the use of the metal in cases where manpower would not be taken from essential war work and where other more critical materials could be replaced. Whenever the manufacture of a particular item was authorized, permission to use aluminum was granted. Aluminum truck and trailer bodies are now being built under WPB authorizations. Among such authorized uses of aluminum during the past year were collapsible tubes, metal containers including cans, tank bodies, motorcycles, electrical wiring devices, domestic mechanical refrigerators, domestic laundry equipment, automatic phonographs, caskets, burial vaults, furniture and furniture parts, aluminum paint, light power-driven tools, cooking utensils, food processing machinery, engineering instruments and industrial type lighting equipment.

HOME FREEZER POSTWAR VOLUME

"Some of the rosy predictions of home freezer postwar volume, should be taken with a grain of salt" is the opinion of P. M. Bratten, general sales manager of the Frigidaire Division, General Motors Corporation, Dayton, Ohio.



"Boy howdy—is he burned up—they hired his wife as a helper!"

Mr. Bratten pointed out that figures released in the press and periodicals indicated annual potential markets ranging all the way from two hundred thousand home freezer units to over two million units. "Certainly," he declared, "there must be something wrong with these widely divided estimates." Frigidaire's own surveys indicated a probable potential of between three hundred and fifty and four hundred thousand units per year in the postwar period and if these figures are anywhere near accurate, there is sure to be some pretty hectic competition between the 132 manufacturers who have indicated that they will produce home freezers.

Price, of course, will be an important factor and although accurate figures cannot be determined at this time, Mr. Bratten indicated that the price of Frigidaire's home freezer would be approximately the same as that of a good household refrigerator. "We all know how price, performance and volume have gone hand in hand in the household refrigerator field," said Mr. Bratten. We believe it no more than reasonable to expect that the same principles will apply in the home freezer field. Quality and performance are especially important here because of the substantial investment users have in products stored in their home freezers. Home freezers must be especially well designed and well built to start with, and in addition they must be backed by top-notch national and local service facilities if they are going to win the kind of public confidence that is necessary to assure a sound foundation."

P. M. Bratten

This being the case, Mr. Bratten feels that the old established manufacturers will have a definite edge in the highly competitive home freezer situation that he foresees. In expressing confidence that the Frigidaire organization would be able to give a good account of itself in this market, he pointed to a nearly a quarter century of experience in design and manufacture of low temperature equipment during which time more than three hundred and fifty thousand Frigidaire low temperature cabinets have been built and sold.

In referring again to the extent of

A product is known by the quality it keeps

PREMIER

"All That the Name Implies"

1911 1914 1917 1920 1923 1926 1929 1932 1935 1940 1942 1944 1945

Premier is known

by the quality it keeps UP

...at a price it keeps DOWN

● Obviously the most severe critic of the quality of a product is the dealer whose business success depends on that quality *—priced right.*

The acknowledged quality of Premier vacuum cleaners is the ultimate result of manufacturing "know-how" acquired through 34 years of making vacuum cleaners exclusively. Now, to that lifetime of fine craftsmanship have been added new skills achieved in the precision manufacture of materials of war.

Evidence of these claims is in the Premier cleaner itself—as any dealer who has been servicing Premier cleaners during these war years will testify.

Premier's "right price" is assured by sound distribution based on the policy of selling Premier cleaners only through the very finest appliance distributors and dealers.

Premier quality—in the future as in the past—can be depended upon to keep Premier "All That The Name Implies" —at a price that will mean a maximum volume of profitable business for every Premier dealer.

Guaranteed by Good Housekeeping

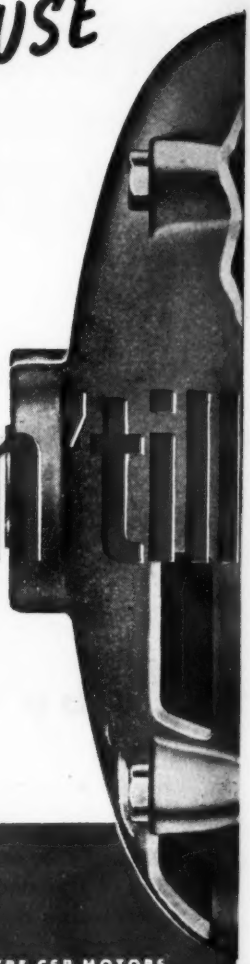
PREMIER

"All That the Name Implies"

ELECTRIC VACUUM CLEANER CO., INC. • CLEVELAND 10, OHIO

ANOTHER WESTINGHOUSE MOTOR "FIRST"

"No Lubrication till



PRELUBRICATED BALL BEARINGS PRACTICALLY ELIMINATE BEARING MAINTENANCE...NOW STANDARD ON TYPE CSP MOTORS UP TO 3 HP

Twenty-two years ago Westinghouse was "first" with the "Sealed-Sleeve" Bearing that eliminated oil leakage, kept out dirt, and reduced maintenance on sleeve bearing motors. Today Westinghouse offers the first self-sealed, prelubricated ball bearing that eliminates lubrication for five years. Type CSP prelubricated motors bought now will need no lubrication until 1950.

Prelubricated bearings in Westinghouse motors have been thoroughly field-tested in thousands of Westinghouse lint-free textile motors. Recently a series of bearings was chosen at random and inspected from a group of 600 motors, the first of which were installed between six and seven years ago. All were in perfect condition—even though they had been in operation 24 hours a day and had never been lubricated.

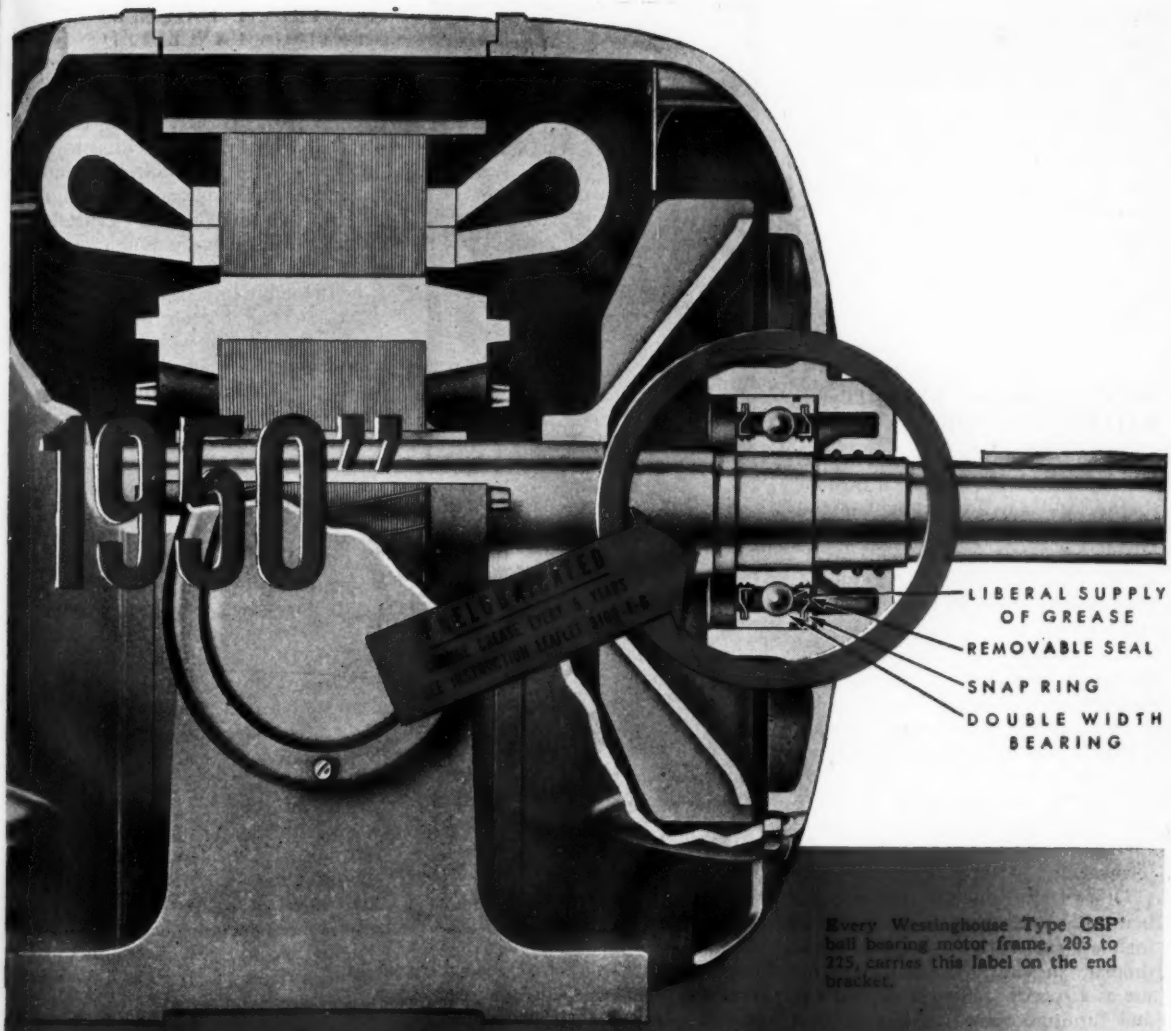
Time-tested special applications such as these have often paved the way for improvements in standard motors. Type CSP motors incorporate the fruits of wide Westinghouse motor application experience. When you buy a Westinghouse Type CSP motor, you get all the latest improvements. For complete information, write for DB 3100-CSP, Westinghouse Electric & Mfg. Co., P.O. Box 868, Pittsburgh 30, Pennsylvania. J-21318

ADVANTAGES

OF WESTINGHOUSE TYPE CSP MOTORS

- PRELUBRICATED SEALED BALL BEARINGS reduce lubrication maintenance ... assure longer grease life.
- IMPROVED TUFFERNELL INSULATION.
- DYNAMICALLY-BALANCED ROTOR.
- DIE-CAST ROTOR with oversize fan.
- LIBERAL THROUGH-VENTILATION—air enters front, leaves at drive-end of motor.

WESTINGHOUSE



Every Westinghouse Type CSP ball bearing motor frame, 203 to 225, carries this label on the end bracket.

PRELUBRICATED SEALED BEARING CONSTRUCTION... retains original grease packing within the stationary seal discs. Bearing chamber accommodates grease sufficient for more than five years of severe service. Held by snap rings, seal discs fit closely over inner race, forming an efficient seal. Snap rings and discs are easily removed to permit packing new grease in bearings.

Westinghouse

TYPE CSP MOTORS

the potential market, Mr. Bratten emphasized the difficulty of forecasting with any degree of accuracy how the demand for home freezers will be affected when food rationing is ended and the food distributing industry puts some of its own postwar plans into effect. Much will depend upon the availability of high grade frozen foods and the willingness of the housewife to learn and to carry out techniques required to get satisfactory results when original freezing is done in the home.

WESTINGHOUSE EXHIBITS KITCHEN-LAUNDRY UNIT

A combination all-electric kitchen-laundry for use by stores as a demonstration center is the highlight of the Westinghouse Electric Appliance Division's exhibit at the Winter Market, of the National Home Furnishings Show, in the American Furniture Mart building, Chicago.

The company's full line of electric appliances is framed as though the products were paintings in "The Art of Better Living" gallery. Each product is framed in a shadow box, reproducing in actual merchandise, in an area 62 feet long by ten and a half feet high, the recent four-color Westinghouse advertisement of their 22 types of appliances.

Other features of the exhibit are a new, animated display for the Westinghouse automatic washer, the Laundromat, an electric roaster shop for use as a special section in department and furniture stores, an electric iron selling center using mass effect for exposure selling and an exhibit of how vacuum cleaners can best be displayed on the sales floor.

The complete combination kitchen-laundry is compactly built in a "U" shape into a space 12 feet deep x 20 feet wide. A double counter extends from the back wall approximately half way into the room, dividing the kitchen and the laundry sections. This middle counter ends in a semi-circular snack-bar which doubles as a work surface and is readily accessible from either side.

Of three Laundromats shown at the Chicago Market by Westinghouse, two are connected for operation and the third is used for exhibition of the animated, four-color display that tells in eight panels the story of the company's fully automatic washer. Each panel lights up successively to explan each of the points in favor of the machine. While space is available in the kitchen-laundry exhibit,

Westinghouse is not showing its new electric clothes dryer at the show. However, a new entirely automatic dryer, now under development, will be mass-produced postwar and will be an important item in the Westinghouse Planned Laundry, according to I. Frank Brownson, manager of the Laundry Equipment Department.

A life-size cutout of an attractive model holding up three fingers to indicate the three simple steps that enable the Laundromat owner to wash without work stands beside the machine. Behind her the "wash without work" story is lettered on a sheet hanging from a clothesline. The display will be available as a part of a promotion that will be released shortly from the Appliance Division's headquarters plant at Mansfield, Ohio.

"Roasters have now reached the point of acceptance in most markets that they should be afforded more space in department and furniture stores," said V. E. Freeland, director of Department and Furniture Store Sales, in commenting on the Westinghouse display of a suggested electric roaster shop. "Roasters represent a high unit sale and considerable dollar volume. Dramatized in a department and properly merchandised, they can result in real profits for the major account," he declared.

SOUTHERN DISTRIBUTORS APPOINTED BY WARREN

Distributors for the Warren Telechron Company in the Southern territory were recently appointed, according to announcement by Franklin B. Davis, Southern District manager, of Atlanta, Georgia. Nineteen distributors have been named to serve the states of South Carolina, Georgia, Florida, Alabama, and Tennessee.

ELECTRICAL INDUSTRY MEETINGS CANCELLED

In cooperation with the recent request of the government that no conferences be held where over fifty people are present, unless essential to the furthering of the war effort, the annual Commercial Conference of Edison Electric Institute has been cancelled. It had been previously announced for March 26-29, 1945, at Edgewater Beach Hotel, Chicago, Illinois.

At a recent meeting of the executive officers of the Commercial Division General Committee of the institute called by Chairman G. W. Ousler, on January 9th, at Pittsburgh, it was decided that although the annual meeting should be cancelled this would not preclude the meeting of committees having subjects of importance to be discussed. This year the committees are active in numerous fields and are alert to the needs for solving present problems. However the new method of carrying forward the committee routine, and localizing activities sectionally, will keep well within the request order of the Government and assist in gaining its objectives.

* * *

The spring meeting of the National Electrical Manufacturers Association, scheduled for the Palmer House, Chicago, for the week of April 16, 1945, was cancelled by the Board of Governors at its meeting held on January 18, in accord with the policy laid down by James F. Byrnes, director of War Mobilization.

* * *

The National Electrical Wholesalers Association, acting upon the public request issued on January 5th by James F. Byrnes, director of War Mobilization has called off its 37th Annual Convention scheduled for the week of April 22nd, at the Stevens, Chicago.

* * *

The Southern Safety Conference which was scheduled to be held in Winston-Salem, North Carolina, March 18-19-20, 1945, has been postponed until the government ban on conventions is lifted. Ronald Hocutt, of Raleigh, N. C., general chairman of the conference announced the decision to defer the meeting which was expected to attract 700 delegates from 14 states.

* * *

Postponement of the International Lighting Exposition scheduled for Chicago on April 19-23 until 1946 has been announced by the chairman of the Industrial and Commercial

Know-how!

BULLDOG BUStribution DUCT

MANUFACTURERS, large and small, turn to BullDog for the real "know-how" in electrical distribution.

This is only natural, for BullDog pioneered plug-in power and lighting systems, and has introduced every important new improvement.

Three modern BullDog DUCT systems, the most widely used in industry, provide complete versatility and flexibility of power and light for every type of industrial application.

BUStribution DUCT (illustrated above) for plug-in power at any point—Industrial Trol-E-Duct for portable tools, cranes, hoists and other "moving loads"—Universal Trol-E-Duct for completely flexible lighting.

For quality as well as "know-how," BullDog has enjoyed a reputation of leadership for nearly half a century.

Write for our illustrated bulletins for detailed information. Or, better yet, our expert staff of conveniently located field engineers will welcome an opportunity to work with you on your electrical distribution problems.

Buy More War Bonds

BULLDOG

ELECTRIC PRODUCTS COMPANY

Buy More War Bonds

BOX 177, R. PK. ANNEX, DETROIT 32, MICHIGAN
In Canada: BullDog Electric Products, Ltd., Toronto
Field Engineering Offices in All Principal Cities

Also Manufacturers of
SafeFuse Panelboards — Switchboards — Circuit Master Breakers—BUStribution Duct, for "plug-in" power—Universal Trol-E-Duct, for flexible lighting — Industrial Trol-E-Duct, for movable "loads."

Lighting Equipment, of the National Electrical Manufacturers Association, S. R. Naysmith. This action resulted from the desire of the association to co-operate fully with the expressed desire of the government to reduce travel resulting from conventions and expositions.

PHILCO TO PRODUCE FREEZER CHESTS

Expansion of Philco Corporation's activities to include the production of household freezer chests for processing and preserving frozen foods will start as soon as war conditions permit, John Ballantyne, president, announced recently in a letter to stockholders accompanying the December 27th year-end dividend.

"Recent estimates indicate that approximately 3,000,000 families in the United States are using lockers in central storage depots to store frozen foods," Mr. Ballantyne pointed out. "It is our belief that at least one-quarter of this number, or 750,000 families, will want freezer chests in their own homes within the first two years after the war. As the use of frozen foods increases in later years, the market should correspondingly grow in size and importance."

The quick freezing and storage at very low temperatures of many kinds of foodstuffs, including fruits, vegetables, meat and fish, as well as cooked foods, has been given tremendous impetus during the past three years, Mr. Ballantyne said. This method of processing foods fully preserves their taste, freshness, and vitamin content over long periods of time.

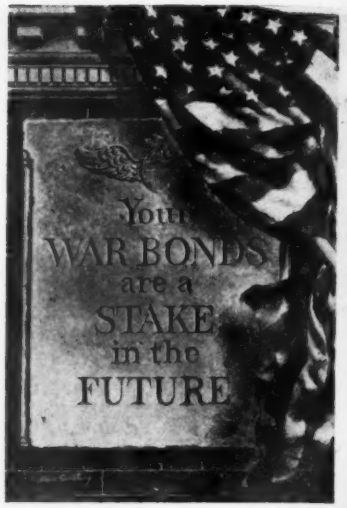
"With a postwar freezer chest, it will be possible to buy at least a week's supply of meats, fruits and vegetables at one time and store them indefinitely," Mr. Ballantyne continued. "Use of a freezer chest will help any family enjoy better food and save money by buying when things are in greatest supply and keeping them until needed."

Philco will produce a full line of freezer chests to meet the various needs of the public, Mr. Ballantyne indicated. They will be suited for the use of single-family homes, apartment houses, and on farms, where greater capacity is required.

SOUTHWEST POWER PLANS EXPANSION

Because the postwar manufacture of electric appliances will be unlimited and expansion of rural electric lines will use all the electrical energy which can be manufactured in the Southwest, a vast program is already underway for a network of hydro-electric power lines in Oklahoma, Texas and Arkansas.

This will be a project of the Southwest Power Administration, of which Douglas Wright, of Tulsa, Okla., is administrator. Lee Simmons, of Sherman, Texas, is in charge of the power division which is located at the Red River dam, on the Oklahoma-Texas line, near Denison, Texas.



Both Wright and Sherman recently held a conference in Washington with Abe Fortas, Undersecretary of the Interior, regarding a provision of the flood control act which authorizes the Secretary of the Interior to build power lines to distribute the energy generated by power dams when no other facilities exist. Power projects in the Southwest were also authorized in the postwar flood bill which was recently approved and studies are being made of distribution facilities available and needed.

When the lake behind the dam at Denison is filled, Denison will increase its generating capacity from 30,000 kw. to 145,000 kw., according to Mr. Simmons, who also said the Southwest Power Administration could be expanded to operate power projects on rivers throughout Texas and could operate cooperatively with state agencies operating power dams on the Brazos and Colorado rivers.

Mr. Simmons said the output of the Denison dam now goes to the Texas Power and Light Company and that under the provisions of the flood control act that cooperatives and municipalities would have first call on energy generated under the auspices of the Southwest Power authority.

Development of the tri-state network of power lines would come after the war but plans and specifications could be completed before the end of the war, it was said. Officials of the Southwest Power Administration are now making a study of the needed and existing facilities through the three states.

"Things are in an awful upside down condition back here in the shop, B. J.!"

1 Emergencies call for quick action. 2 Without delay, dispatcher calls truck closest to the trouble. 3 Repair crews get to the trouble quickly by the shortest route. 4 Service restored. Truck on its way to next job.

G-E 2-way FM radio speeds repairs

Wherever and whenever power disruption threatens, maintenance must get on that job—fast.

G-E 2-way FM radio is a powerful coordinator that enables you to communicate direct with your field repair crews and enables them in turn to communicate with each other. It is an important maintenance tool that will help you through every emergency and improve your service continuity. It will give you effective communication day and night, through every kind of weather.

In serving your radio communication needs, General Electric offers you the same specialized attention that is extended to you in your power distribution and maintenance requirements. Call your General Electric sales engineer when you discuss your communication problems. He will have a specialist assist in planning the most effective system for your particular installation. Write to *Electronics Department, General Electric, Schenectady 5, N. Y.*

Government regulations now permit new installations of 2-way FM radio for important requirements of utility companies. Let your G-E representative help prepare your applications.

Write for these booklets: "G-E FM Communication System Guide" gives you practical facts about the selection of 2-way FM radio and will assist you in estimating total installation costs. "G-E FM Communication Equipment Catalog" describes and illustrates the required units and equipment.

Hear the G-E Radio programs: *"The World Today" news, Monday through Friday, 6:45 p. m., EWT, CBS. "The G-E All-Girl Orchestra," Sunday 10 p. m., EWT, NBC. "The G-E House Party," Monday through Friday, 4 p. m., EWT, CBS.*

Everything for 2-way radio communication

GENERAL ELECTRIC

FM CAMPAIGN LAUNCHED BY STROMBERG-CARLSON

A campaign "to stand frequency modulation on its own two good feet" has just been launched by the Stromberg-Carlson Company, one of the nation's largest peace-time manufacturers of radio, television and telephone equipment. The fifty years old company, a pioneer in the FM field, built thousands of pre-war FM receivers, in addition to establishing one of New York State's first FM stations, WHFM, in its home city of Rochester, N. Y.

First step in the far-reaching program set in motion is the circulation of a pair of free booklets fittingly titled "FM—For You," and "Facts About FM." For easy distribution to the public, the booklets have been mounted on an attractive counter card now on its way to each of the company's distributors and their dealers throughout the nation.

With public interest in FM at an all-time high, and a total of 46 commercial FM stations already in operation, as of January 4, 1945, and applications for the postwar construction of 326 more filed to date with the Federal Communications Commission, radio industry leaders anticipate that the practically static-free broadcast medium will offer the greatest development and eclipse all others in the communications field in the immediate postwar period.

Said Dr. Ray H. Manson, vice-president and general manager of Stromberg-Carlson, and a director of Frequency Modulation Broadcasters, Inc., and a committee member of the Radio Technical Planning Board, "The booklets, although written in the simplest layman's language, have not sacrificed an iota of technical or scientific accuracy. Every discovery and invention brought to the eyes of men has been ridden with the exaggerations, inadequate information and misconceptions in the minds of the public which have beset FM. If the booklets succeed in clearing the decks of only half these deviations from fact, they will have achieved a worthy purpose."

"FM—For You," in its fifteen pages, traces the history of the system of ultra-high fidelity radio reception discovered by Major Edwin Armstrong, noted American communications engineer, now a professor of electrical engineering at Columbia University. Bearing the official imprint of FMBI, the booklet, in quiz and answer form, goes behind the curtain to get the facts about FM, what it is, and how it ticks. "Facts About FM" deals with Stromberg-Carlson's extensive postwar plans to apply wartime developments in high frequency communications engineering to the science of building improved FM receivers.

FRIGIDAIRE PLAN FOR VETERAN EMPLOYMENT

Carl A. Copp, manager of Industrial Relations, Frigidaire Division, General Motors Corporation, Dayton, Ohio, recently announced the putting into effect of a program for veterans' re-employment. The plan is recognized by employee relation and employment experts as one of the most comprehensive in industry. At the present time a total of 230 discharged veterans of the present war, formerly employed by the Frigidaire factory are back at work in the Dayton plants under this re-employment program.

The plan includes features not found in many other veterans' programs, in addition to carrying out the provisions of the re-employment section of the Selective Service Act. Under this act, a former employee who is honorably discharged from the armed services is entitled to his old job back if it was not a "temporary" job; if the job is still operating; if the veteran wants his old job; if he is able to perform the duties of the job and if he applies for re-employment within ninety days after being discharged from the armed forces. A hospitalized veteran has ninety days after his release from the hospital, provided he was not hospitalized more than a year.

Special features of the Frigidaire re-employment plan provide that all jobs are analyzed by department supervisors to establish a record of minimum physical requirements. Likewise, all job applicants, civilians as well as veterans, receive thorough physical examinations by the company medical department to determine how their various physical qualifications compare with the physical requirements of the many different jobs analyzed.

C. A. Copp

The Frigidaire plan also provides definite procedures for placing job applicants who are physically handicapped on carefully selected jobs that they are able to handle. Then as their physical ability improves, special provision is made for their advancement to jobs suited to their improved physical condition, when such jobs are available.

FARADAY TO NEED MORE PLANT SPACE

Faraday Electric Corporation officials, outlining postwar plans and displaying new products to 80 national representatives and exporters at a recent meeting in Adrian, Michigan, believe that extensive factory expansion and a much larger working force will be necessary after the war to handle an increased volume of business.

Lewis J. Stern, manager of the Adrian plant, said that if plans are realized, the company will need at least four times as much factory space as it now occupies. The number of employees probably will be increased three or four times that of the present force, he added. Through the medium of well laid plans, the company hopes to go from 100 per cent war work to civilian economy without the necessity of layoffs and reduced employment.

Outside designers and engineers employed by Faraday have been working on postwar products and designs for more than a year. An extensive line of new door chimes has been designed and developed for house use. Ten or twelve models of the chimes have been displayed to the national representatives.

A plugmaster electric cord designed to fit any type of electrical appliance also has been developed and will be

produced in volume when materials are released. An electric broiler lid which fits over the top of frying pans will broil steaks and chops instead of frying them. More than 25 other regular electric items made in other years also will be back in production with improvements.

UNIVERSAL PLANS 1945 PROGRAM

"U" Plan for Better Living" is the keynote of Universal's 1945 advertising campaign which is being announced by Landers, Frary & Clark, New Britain, Conn. Coming on the heels of the nationally known "U" Plan for "V" Day, which 16,000 dealers are now making use of to bring about millions of consumer contacts, this new, forceful campaign will continue to enforce the basic formula of the "V" Day plan and incorporate many new features to make postwar appliance selling an easier and better performance.

Fifty million families will learn how to plan for their future appliance and housewares purchases in the new series of striking four colored advertisements scheduled to appear in 16 leading national magazines throughout the year.

With the "U" Plan for "V" Day laying the groundwork in '44 by building up a large potential market for different types of appliances the "U" Plan for Better Living will concentrate on bringing to the American consumer the specific Universal products to be made in postwar days and show how the American housewife can easily purchase complete household equipment, from Universal when manufacturing is again underway.

New products which the company will launch on the market when the war is won will be shown for the first

THANKS, Mr. Providence,
Mr. Syracuse,
Mr. Scranton . . .
YOU appliance dealers of three cities have just given us some fine ideas on postwar merchandising. Our survey will continue: because Proctor believes in market research . . . to find out what kind of appliances dealers want to stock and sell . . . to find out what kind housewives want to buy!
Good ideas make good appliances
You start with good ideas. You add fine product engineering. Then . . . smart styling and an attractive price tag. There you have it—the line of Proctor appliances that will make news after victory. Meanwhile, "back the attack" with war bonds.
PROCTOR
NEWSMAKER IN APPLIANCE MERCHANDISING
PROCTOR ELECTRIC COMPANY—DIVISION, PROCTOR & SCHWARTZ, INC., PHILADELPHIA 40, PA.

time to build consumer recognition now and lessen the task of retail selling.

The check list, feature of '44 advertising has been modified and will feature designs of appliances together with over 25 appliance listings. It will continue to play an important part in all consumer advertising. As in the "U" Plan for "V" Day, the consumer will be encouraged to survey her needs of the future and to set up a home plan by which she saves for postwar appliances.

KELVINATOR BOOKLET FOR HOME PLANNERS

Kelvinator retailers have begun to lay the groundwork for future sales through prospect-building distribution of an important new merchandising tool based on the intense public interest in new home-planning, C. J. Coward, director of advertising and sales promotion, Kelvinator Division, Nash-Kelvinator Corporation, said recently.

"Perhaps never before has the public been so actively planning for the future as it is today, and Kelvinator developed its new 'Home of Your Dreams' booklet with the object of helping our retailers and products to be part of those plans," Coward said. "We have offered the booklet in our recent national advertising, and the response has been tremendous, but the most important distribution is in the hands of Kelvinator retailers, with direct prospect contact."

In full color, the 32-page booklet gives the home planner original plans of the six most popular types of small homes, each one distinctive in style and livability. It emphasizes original kitchen designs with "built-in charm" for each type of home plan, and offers, in addition, an array of stimulating home-making ideas.

"The kitchens illustrated in the booklet introduce a refreshing concept of kitchen design," Coward pointed out. "They are neither expensively elaborate nor economically barren. Rather they are distinctive and completely modern, with smartness and originality deriving from a little extra carpentry and decoration.

"The homes are practical and buildable, not just dreamhouses, and the basic plans can be converted readily according to individual preference. And throughout the booklet, the advantages of electrical living and modern appliances are emphasized repeatedly."

The objective behind the activity is outlined in the merchandiser and distribution plan book which accompanies supplies of the booklet sent to Kelvinator retailers throughout the country.

"This new booklet ties in with current public interest in homes and kitchens, and directs home planners to your store," the merchandiser says. "It ties in with kitchen remodeling programs and makes your store distinctive as headquarters for 'postwar kitchen' information. It is planned for long range results, since demand for appliances will be far ahead of supply for some time. The activity is designed to create interest in appliances and friendship for your store . . . and hold it until you can 'deliver the goods'."

PRICES OF SLIMLINE LAMPS ANNOUNCED

List prices of the new "slimline" fluorescent lamps, which are scheduled for production as soon as war conditions permit, have been announced by the lamp manufacturers.

The new lamps, all high efficiency hot cathode types, will be available initially in 42 inch, 64 inch, 72 inch and 96 inch overall length, taking into account the sockets and single pin bases at both ends. The 42 inch lamp, which measures ¾ inch in diameter, is listed at $1.55. The list price of the 64 inch fluorescent tube, also ¾ inch in diameter, is $1.75. The 72 and 96 inch lamps, both one inch in diameter, will have list prices of $2.00 and $2.70 respectively.

The slimline lamps were developed for showcases, wall cases or coves in stores, restaurants or other places where a long, slim light source is desired.

REA REPORTS INCREASE IN SERVICE DURING 1944

Despite wartime restrictions, the number of farms and other rural consumers obtaining electric service from REA-financed rural power systems increased by about 10 per cent during the fiscal year 1943-44, according to the annual report of the Rural Electrification Administration to the secretary of agriculture, Claude R. Wickard.

At the end of the fiscal year, REA systems were providing service to 1,152,013 consumers, an increase of 110,210 over the 1,041,821 served a year previously. The year's increase was 81.7 per cent greater than the increase in the number of consumers during the fiscal year 1943.

Farms and other rural consumers served by the REA systems were billed for a total of 1,800,000,000 kilowatt hours of electric energy during the fiscal year. This was an increase of nearly 23 per cent over total consumption of the previous year. The systems' retail power sales during the year amounted to $59,826,963, as compared with $51,826,963 in 1942-43.

All power line construction by REA systems during the year was undertaken in accordance with War Production Board regulations, which varied from time to time during the year according to the amounts of materials available for civilian use. The great majority of new consumers connected during the year were farms which qualified for service under government regulations, enabling them to use electrical equipment to produce needed foods and to alleviate the shortage of farm help.

NEMA TOPS RECORD OUTPUT IN 1944

The electrical manufacturing industry's production index for 1944 topped by five per cent the all-time record output of '43—despite the fact that ten-month indices for all industries showed a one per cent decline, W. J. Donald, managing director of the National Electrical Manufacturers Association, New York, announced recently.

For the first time in the industry's history, production of non-electrical products accounted for a sizable percentage of the total, approximately one-quarter, Mr. Donald said.

Light and heavy ammunition, combat tanks, aircraft, hardware, machine tool attachments and business machines formed the bulk of the non-electrical products, the NEMA managing director reported, emphasizing that shifts of manpower and materials from production no longer essential enable the industry to assume this added task while also meeting the huge wartime need for electrical apparatus.

Electrical manufacturers produced approximately nine billion dollars worth of products during 1944, Mr. Donald continued in his year-end summary. The biggest gain in the electrical field was in signalling and communications equipment, he declared. He attributed this to the vastly stepped-up output of telephone equipment—particularly field and ship telephones—and signalling apparatus.

Other increases noted were in illuminating equipment, insulating materials, and X-ray and therapeutic apparatus.

The output of industrial apparatus, wire and cable and transmission and distribution equipment continued steady with the 1943 record.

Appliance sales, already near bedrock, showed a still further dip, Mr. Donald said. There was a fifty per cent drop in sales of major appliances such as refrigerators, washing machines, vacuum cleaners, ranges and water heaters—and this reduction offset the slight gain in sales of the small appliances. Sales of refrigerators, washing machines and ironers continued to come from pre-war stocks.

The 1944 sales of appliances, and their production, were limited primarily to meet requirements of the armed forces, lend-lease and other government agencies, and the most essential civilian needs. In connection with civilian needs, Mr. Donald noted relaxation of government restrictions to permit production of a limited number of electric irons. There was a ten per cent drop in sales of electrical building equipment and supplies, such as fuses, wiring devices, knife switches and outlet boxes.

FARADAY BUYS SIGNAL SYSTEMS BUSINESS

Faraday Electric Corporation, Adrian, Michigan, announces the purchase of the signal systems business of the Holtzer-Cabot Electric Company, of Boston, Mass.

Holtzer-Cabot operations will continue in the Boston plants through January and February, after which they will be transferred to the Faraday plants in Adrian and Chicago.

The Faraday Electric Corporation is a consolidation of two prominent signaling system companies, Stanley & Patterson, Inc., of New York, and Schwarze Electric Company, of Adrian.

Chromy says

"Here's the name to hold to in range units"

It's a CHROMALOX Tubular

GOODWILL BUILDER FOR YOU because:

Cross section of Inconel sheathed tube shows how Chromalox design provides maximum contact surface, rigidly maintained. This means better cooking for longer time at lower cost for your Chromalox customers.

Chromalox Tubular Range units have been tested and approved in the most exacting laboratories in the world—the kitchens of America! Before the war, 30,000 ranges were equipped.

Famous Chromalox Tubulars will soon again be available.

Chromalox Superspeed and Heatflo—to fit any range—are available now.

EDWIN L. WIEGAND CO.
7600 Thomas Blvd., Pittsburgh 8, Pa.

CHROMALOX

Government News and Views For the Electrical Industry

IMPROVEMENTS IN STREET LIGHTING

Modernization and extension of the street lighting system in Birmingham, Ala., at a cost of $205,000 to include 929 additional street lights and use of a pendant type standard providing 100 per cent more illumination than present standards in use, were embodied in a five-year contract approved recently by the City Commission with the Birmingham Electric Company.

Under terms of the contract, the electric company will bear the total cost of installation of the new lights and modernization of existing street lights in the downtown area and other sections of the city.

Installation of the new lights will begin as soon as the materials and labor necessary are made available through the War Production Board.

When completed, the city will have a total of 7,145 street lights in operation at an average maintenance cost of $19.47 per light a year. During the last fiscal year the city's budget for its street lights totalled $125,000 of which $116,000 was spent.

Mayor Cooper Green said a thorough study of the new lighting program showed that when completed it will result in fewer night-time traffic accidents, aid police in crime prevention, improve both day and night appearance of the city streets, aid control of traffic, increase property values, aid business and advertise the progressiveness of the city.

APPLIANCE DIVISION ADDED TO MILLS-MORRIS COMPANY

Mills-Morris Company, Memphis, Tennessee, distributors of Motorola radios for the past six years, will operate a complete Radio and Electrical Appliance Division and is now considering dealer applications for sales and service contracts on nationally known products. The enlarged division will distribute all domestic appliances wholesale only, to dealers. Headquarters and display rooms for the division will continue to be at 171-175 South Dudley Street.

Established in 1919, Mills-Morris Company is now one of the South's largest distributors of automobile parts and equipment. Heretofore, the electrical appliance division was limited in its operations, but the company contemplates greatly increasing this department, and postwar merchandising and advertising plans include a separate sales organization to thoroughly cover the Memphis and Mid-South territory.

WPB APPROVES RANGE PRODUCTION

Production of 35,000 domestic electric ranges per quarter has been approved for 1945, the War Production Board told representatives of the Domestic Electric Range Industry Advisory Committee recently.

About 35 per cent of these ranges will go to the military services and the National Housing Agency, the remainder to institutions and individual consumers who certify need and can show that no additional wiring will be required on their premises.

The 1945 production rate per quarter, the same as that estimated to have been reached in the fourth quarter of 1944, is in line with WPB policy which states that 1945 civilian goods production per quarter cannot, in general, exceed that of the final quarter of last year.

The 140,000 domestic electric ranges authorized for this year at the fourth quarter 1944 production rate of 35,000 compares with 88,000 authorized by WPB for 1944 production. Actual 1944 output, however, was about 76,000 units, as a result of manpower shortage, WPB said.

Committee members recommended that their industry be permitted to place advance orders for materials, with AA-3 rating, to provide for prompt delivery when reconversion becomes possible.

MANPOWER SHORTAGE STOPS IRON PRODUCTION

The Westinghouse Electric and Manufacturing Company voluntarily stopped production of electric irons for civilians in its plant at Mansfield, Ohio, on January 8, 1945, in order to transfer employees to critical war work.

J. H. Ashbaugh, vice-president of the company, in a letter informing the Consumers Durable Goods Division, WPB, of this action, said:

"We are voluntarily halting this civilian goods production due to the critical manpower situation in this area. New orders for urgently needed war goods and advanced schedules in this plant will soon require employment greater than at any time since Pearl Harbor. It has been our stated policy that we would not permit

"Hello, OPA office—on that little wiring job you want us to do—th' boss says if you'll come down and fill out a couple dozen of your forms, he'll get to it sometime next week."

civilian goods production to interfere with war work, and it is in line with this policy that we are closing the iron production."

WPB EXPLAINS ORDER L-123

The War Production Board has issued an explanation of controls over the sale of new fractional horsepower motors. This explanation was believed advisable because such motors are in short supply and because many persons apparently do not understand the restrictions regarding their sale, WPB said.

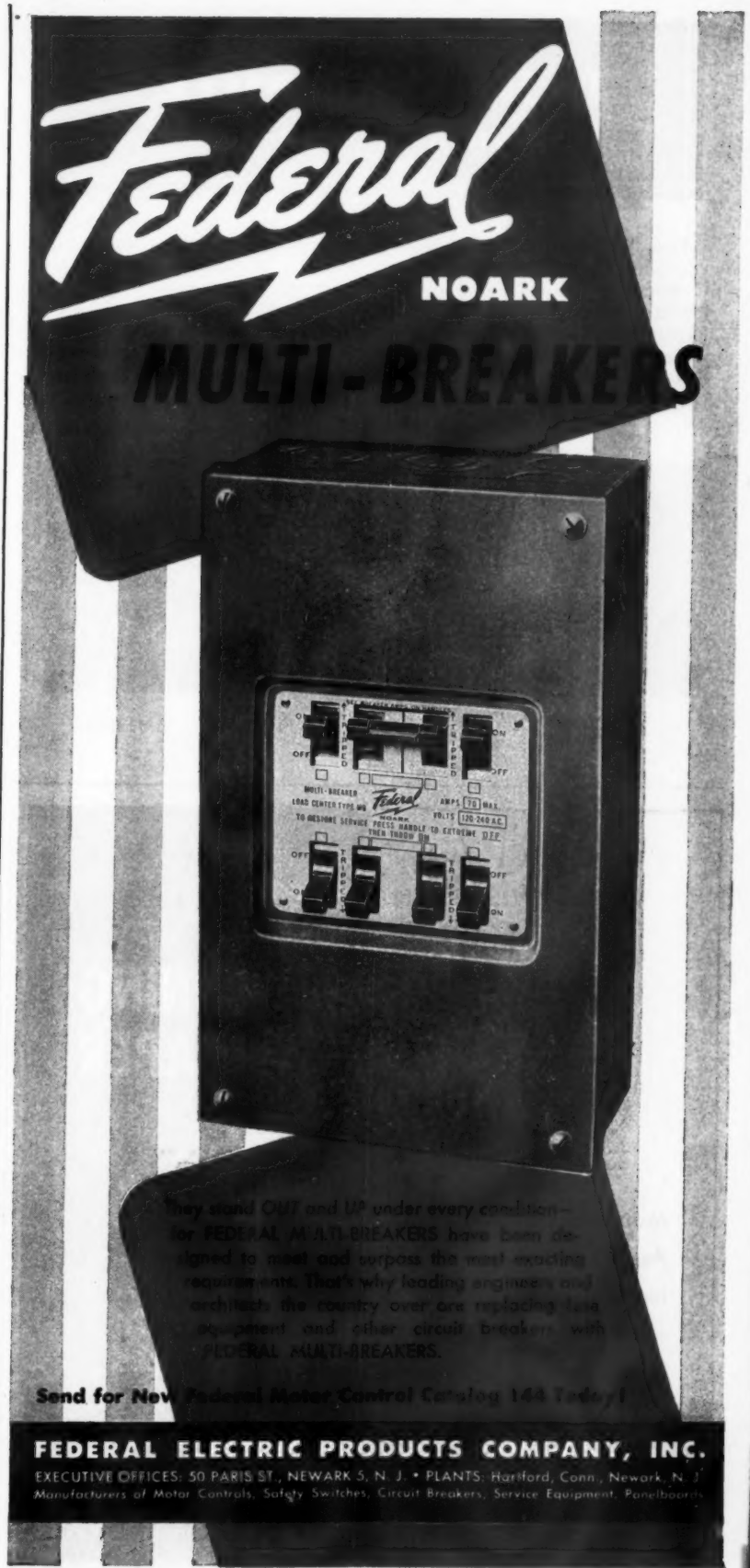
A certain number of fractional horsepower motors are being allocated each month for civilian and commercial replacement purposes. It is important to the war effort that these be sold and delivered strictly in accordance with prescribed regulations. WPB said.

Order L-123 controls the distribution of these motors. It provides that no person, including a manufacturer, distributor or dealer, shall accept any order for a new fractional horsepower motor or make delivery of one except on an order bearing a preference rating of AA-5 or better. Neither can any person accept delivery of such a motor unless he has a rating of AA-5 or better.

There are, however, two types of sales that do not require ratings. One is the sale on a farmer's certificate of purchase provided for in Priorities Regulation No. 19. The other is delivery of a new motor to a householder or other user for replacement of a damaged motor, and the seller, in accordance with his regular business practice, takes the damaged motor in return and repairs it, or delivers it for repair to another person, so that it will be available for resale. When repair is not practicable, however, the damaged motor may be scrapped. A dealer or repairman may also turn in a damaged motor to a manufacturer or other supplier and receive in exchange a new or rebuilt motor without a rated order.

If a motor is delivered without a properly rated order or without meeting either of the qualifying provisions outlined, both the seller and the purchaser are in violation of the order and are subject to the prescribed penalties.

Motor manufacturers, distributors, dealers, mail order firms, repair shops and all other sellers of new fractional horsepower motors must familiarize themselves with the provisions of Order L-123, WPB officials emphasized.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NOARK
MULTI-BREAKERS
They stand OUT and UP under every condition—
for FEDERAL MULTI-BREAKERS have been designed to meet and surpass the most exacting
requirements. That's why leading engineers and
architects the country over are replacing fuse
equipment and other circuit breakers with
FEDERAL MULTI-BREAKERS.
Send for New Federal Motor Control Catalog 144 Today!
FEDERAL ELECTRIC PRODUCTS COMPANY, INC.
EXECUTIVE OFFICES: 50 PARIS ST., NEWARK 5, N. J. • PLANTS: Hartford, Conn., Newark, N. J.
Manufacturers of Motor Controls, Safety Switches, Circuit Breakers, Service Equipment, Panelboards

PERSONAL NOTES
About Men You Know

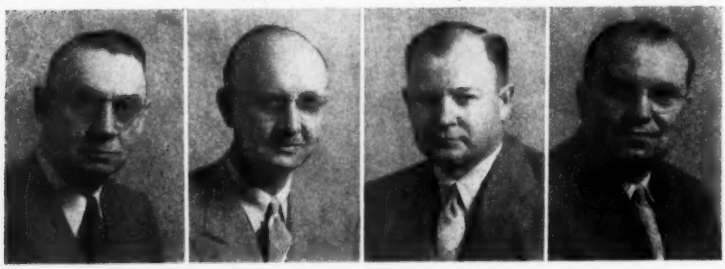
Paul V. Sprout, service manager, Frigidaire Division, General Motors Corporation, has announced the following appointments in the Service Department. **Clark P. Ogden** has assumed the position of supervisor of Service Parts Sales and the Field Contact Division; **Ralph K. Eley**, that of supervisor of the Service Technical Division, in complete charge of training, service literature, field shop operations and Field and Factory Technical Contacts; **R. V. Leslie**, the post of supervisor of the Service Inventory Control Division, replacing **A. J. Ritten** who is now a member of Frigidaire's Market Research and Organization Department.

Mr. Ogden has been with Frigidaire since 1933 and has been actively engaged in supervisory capacities in the Service Department. In 1942, he was assigned to special service as instructor in the operation of the .50 caliber machine-gun.

Mr. Eley, supervisor of the Technical Division of the Frigidaire Division, General Motors Corporation, is responsible for many of the innovations and overall plans in Frigidaire's Service Programs, and has been employed continuously by Frigidaire since 1927.

Ralph V. Leslie the new supervisor of the Service Inventory Control Division is another Frigidaire veteran. He has been a member of the Frigidaire family since 1928 and before assuming his present position he was a foreman in the Technical Division.

Alfred J. Ritten who is now a staff member of Frigidaire's Market Research and Organization Department has a record of fourteen years' experience in the Frigidaire Service Department.



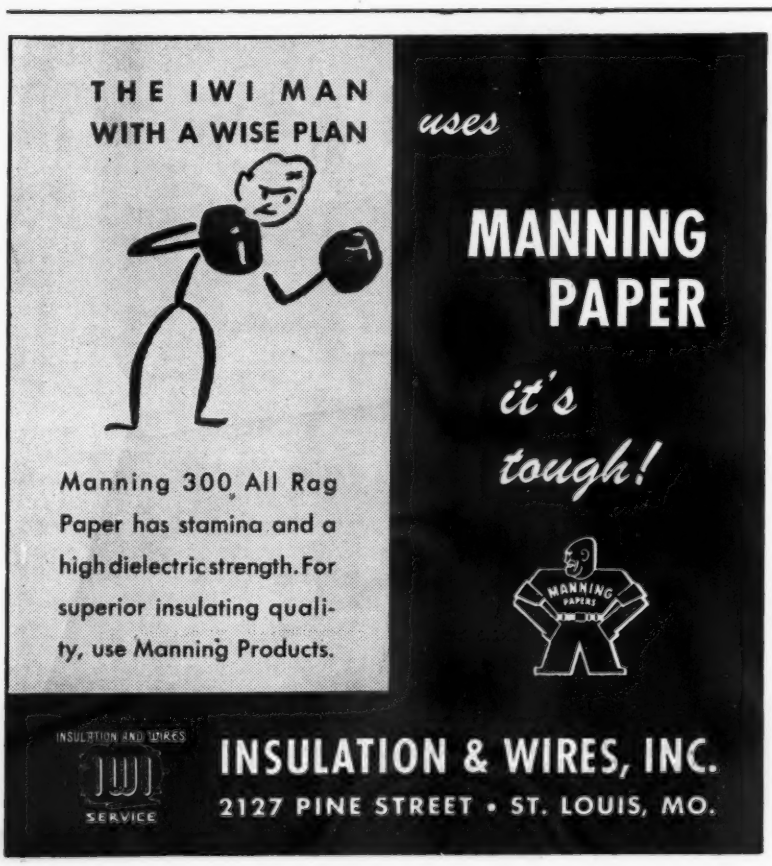
C. P. Ogden R. K. Eley R. V. Leslie A. J. Ritten

* * *

Paul H. Puffer, formerly director of postwar planning of the Norge division of Borg-Warner Corp., has been named a vice-president to develop a sound employee and public relations program.

In announcing the appointment, **Howard E. Blood**, president said, "Under the present stress of war conditions and the approaching problems of reconversion and gradual adjustment to peace conditions, much confusion may result. It is an obligation of any company to keep the consumer, its distribution agents, and its employees completely informed on all matters of

Paul H. Puffer



policy, production and employment. For this reason, Mr. Puffer was appointed to create such a program and co-ordinate our activities along this line."

Mr. Puffer has been with Norge for the last 11 years and in this time has served in a number of important executive capacities. Prior to the war, he was general sales manager, and after Pearl Harbor acted as contact man with Washington officials during the company's conversion to war work. This activity was followed by one in which he was liaison man between the company and government agencies on war contracts.

* * *

The appointment of **Stuart Goodwillie** as manager of the Central Station Sales in the Lighting Division has been announced by Sylvania Electric

Stuart Goodwillie

Products, Incorporated. For the last two and a half years Mr. Goodwillie has been in charge of organization development for Sylvania. A veteran in the sales management field, his business connections include E. I. du Pont de Nemours, where he served as assistant manager of sales research for the rayon and cellophane division; Robert Heller and Associates, Incorporated, in the capacity of management consultant; vice-president of the Corliss Salt Company of Syracuse, New York; and the Trundle Engineering Company, Incorporated.

* * *

A number of changes have been announced in the Southwestern Gas and Electric Company's power production departments by **Frank M. Wilkes**, president.

J. Robert Welsh has been appointed to fill the newly created position of operating superintendent. He will have charge of the production and transmission of all the electric energy to outgoing terminals.

So what? **Friend, you just don't know the man you're talking to... the dealer who sold fans before the war and will again after. Ask him what he thinks about something called *consumer acceptance.***

If a product has *that,* it's easier to sell. Its reputation is firmly established in the minds of customers. It's the assurance a buyer senses in an article whose maker has spent years on one kind of job, getting it down pat.

After all, the dealer is more businessman than gambler. He's seen new faces in the fan field come and go. He's also seen a name like Robbins & Myers come a long time ago, to stay.

Sure he's alert, on his toes. But he's not the would-be opportunist who will fall for the first bit of postwar merchandise that hits the market. His business has been built over the years. And his eyes are focused quite a way beyond something as fleeting as one day—tomorrow.

So what? You tell us.

"Never heard of it? So what? This fan is brand new!"

If you have any problems involving electric fans, if you need repair parts for R & M Fans or want complete repair jobs done *for* you—get in touch with us at Springfield, Ohio, or at the nearest R & M branch office listed here.

New York	200 Varick St.
Chicago	2400 W. Madison St.
Philadelphia	401 N. Broad St.
Kansas City, B. M. A. Bldg., Room 325,	215 Pershing Rd.
San Francisco	237 Rialto Building
New Orleans	116 Arlington Dr.
Dallas	1100 Cadiz St.
The Robbins & Myers Co. of Canada, Ltd.	Brantford, Ont.

ROBBINS & MYERS, Inc.

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MOTORS · HOISTS · CRANES · MACHINE DRIVES · FANS · MOYNO PUMPS

"EFFICIENCY" DEVICES FOR CONDUIT AND CABLE SUSPENSION

EFFICIENCY
BUSHING SUPPORT

. . . a convenient independent mounting . . . requires only one bolt to be tightened to hold porcelain bushing and clamp to base. Bushings are split-design to reduce power leakage and are completely surrounded by metal. The circular base is adjustable to any angle required for the conductors. EFFICIENCY Bushing Supports are available for Cable diameters from 5/16" to 2-3/8".

Write today for your copy of our Catalog 38B . . . contains complete construction and application data on all EFFICIENCY Devices.

Efficiency
ELECTRIC AND MANUFACTURING CO.

New DUTCH Clothless
COFFEE FILTER
Pat. Pend.

50¢ LIST

LAST MONTH A STAR WAS BORN!
Today it's enthusiastically acclaimed a
PROFIT PRODUCER!

Brilliant FULL-COLOR DISPLAY DISPENSER

LAST CHANCE! Special Introductory BONUS OFFER
You get a bonus of one DUTCH Filter with each 11 that you buy. At 40% off list, you pay $9.90 per case of 3 dozen. Retail them for $18, earning generous
45% PROFIT!

At your jobber NOW!

The Modern PRACTICAL Clothless Filter
★ SPARKLING CHINA . . . virtually unbreakable!
★ SIMPLE, EFFICIENT . . . no cloth or paper!
★ SNAPS IN EASILY . . . can't fall out!

DYNAMIC PROMOTION!
1. Full-color COUNTER DISPLAY-DISPENSER!
2. Free window banners!
3. Free consumer literature!
4. Nationally advertised in 10 major periodicals!

HILL-SHAW COMPANY
Executive Offices
311 North Desplaines Street
Chicago 6, Illinois
Sales offices in principal cities

NOW! AT NO EXTRA COST every Vaculator is equipped with the revolutionary new DUTCH CLOTHLESS COFFEE FILTER

WE CAN SUPPLY ALL THE DUTCH FILTERS YOU CAN SELL!

Another newly created position is that of supervisor of power plants and it is filled by **R. S. Moncrief,** who was formerly chief engineer of the Arsenal Hill Station. He will have charge, under Mr. Welsh, of the operation of all the power generating plants owned by the company.

The third new position is superintendent of transmission and this has been filled by the appointment of **William M. Googe,** who will have charge of the operation and maintenance of lines from power substations to low tension terminals of main substations.

J. Weems Twilley, formerly station machinist, has been promoted to chief engineer at Arsenal Hill Station.

Main offices of the company will continue to be at Arsenal Hill, Frank M. Wilkes, president, said.

* * *

C. E. Scholl has been appointed general manager of Federal Electric Products Company, Inc., Newark, N. J., according to an announcement made by **Thomas M. Cole,** vice-president of the company. He will direct all sales and assume charge of the warehousing of Federal products in all principle cities.

Mr. Scholl has been identified with the electrical industry for more than twenty years. He was formerly sales manager of Bright Light Reflector Company, of Brooklyn.

* * *

The appointment of **Robert E. Burrows** as manager of General Radio Sales, with offices in New York City, has been announced by **David M. Salsbury,** vice-president and general manager of the Westinghouse Electric Supply Company, wholesale marketing subsidiary of the Westinghouse Electric and Manufacturing Company.

Mr. Burrows will be in charge of the

Robert E. Burrows

sales and promotion of the supply company of the newly announced Westinghouse home radios to be built and marketed as soon as war conditions permit.

For the past several years, until his recent affiliation with the Westinghouse Company, Mr. Burrows was supervisor of advertising and sales promotion for the Radio Receiver Division of the General Electric Company.

* * *

The appointment of **Houston B. Watson** as apparatus and supply manager of the Southwestern District of the Westinghouse Electric Supply

Houston B. Watson

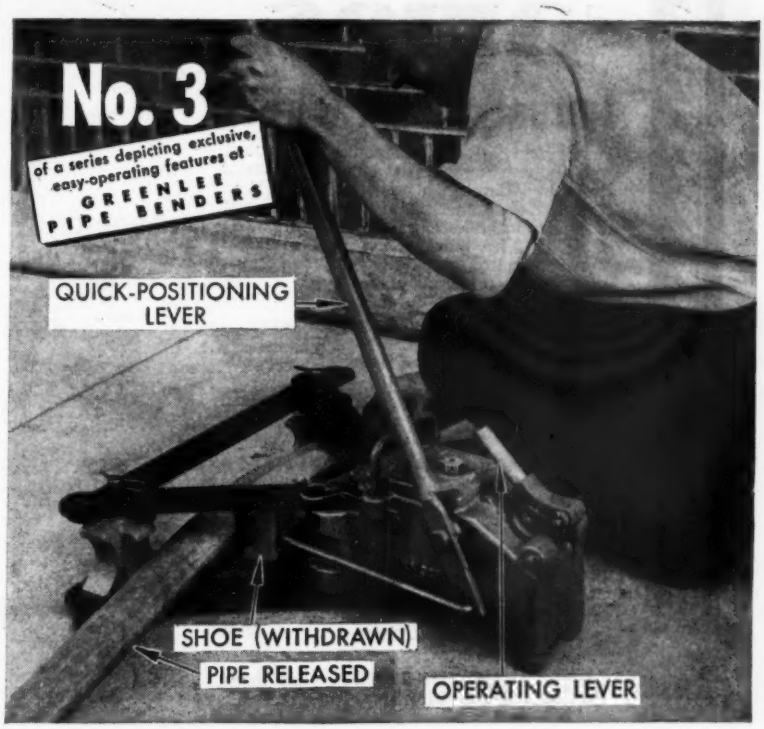
Company has been announced by **C. M. Mackey**, manager of the Southwestern District. Mr. Watson succeeds **W. G. Sterett**, who recently resigned.

Born and educated in Houston, Texas, Mr. Watson first worked for the Electric Appliance Company, of Texas. After five years with this company he became affiliated with the Westinghouse Electric Supply Company, which functions as a national wholesale marketing outlet for Westinghouse products.

In 1931, Mr. Watson left Westinghouse and, after working for three years with the Dallas Power & Light Company, he returned to Westinghouse as a salesman.

* * *

Milton Grey, general sales manager of the Hill-Shaw Company, recently announced an expansion of the Chicago staff to include **Curtis L. Peterson** as advertising director of the domestic and commercial lines of Vaculator coffee makers. Mr. Peterson has been with the U. S. Army, Corps of Engineers, and for several years before army service, was the director of advertising for the Edward Katzinger Company of Chicago.



Pipe easily re-positioned or removed

Here's another reason why *one man* gets smooth, precise bends quickly with a GREENLEE Bender—in pipe up to 4½", rigid and thin-wall conduit, tubing, bus bars.

For speedy withdrawal or to move pipe for second bend, simply force down operating lever to lowest position, releasing pressure. Then transfer handle to quick-positioning lever for withdrawal of ram and release of pipe—immediately!

This is just one of the many specially-engineered "short cuts" to make bending as simple as A.B.C. with a GREENLEE... for important labor and material savings on every bending job, large or small.

Get all the facts on complete line of GREENLEE Benders, and other time-saving tools for electrical workers. Write today for your free copy of Catalog 33E. Greenlee Tool Co., Division of Greenlee Bros. & Co., 1762 Columbia Avenue, Rockford, Illinois.

OTHER GREENLEE TIME-SAVING TOOLS FOR ELECTRICAL WORK:
CABLE PULLERS
JOIST BORERS
HAND BENDERS
RADIO CHASSIS PUNCHES
PIPE PUSHERS

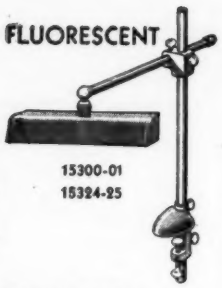
Get Ready with Greenlee!
REGISTERED TOOLS
GREENLEE
FOR THE CRAFTSMAN

Faries

Industrial Brackets

Here's good news for Contractors and Dealers who've been unable to supply Industrial Brackets without high priorities. We've been permitted to resume manufacture of a limited number of incandescent and fluorescent models. Only a few brackets are as yet available but we expect to expand the line as conditions improve.

FLUORESCENT



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INCANDESCENT

3091

41

522½

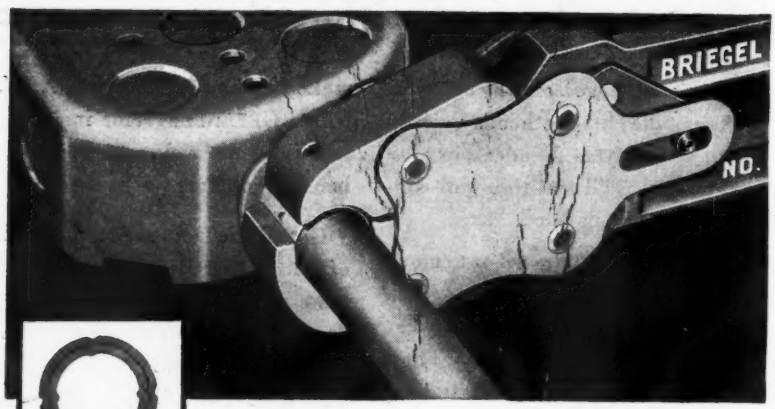
Available for Immediate Delivery
(No preference rating necessary)

No. 41—Bench or Table Bracket.....$ 4.00
No. 3091—Clamp on Adjustable Bracket..... 6.50
No. 522½—Adjustable Wall Bracket. 9.50

Available on Rating of AA-5 or MRO AA-1 or AA-2

No. 15300—Horizontal Vertical Adjustment for single 15-watt bulb.....12.50
No. 15301—Same as No. 15300 but equipped for 2-15 watt bulbs.....22.50
No. 15324—Same as No. 15300 but with base clamp for single 15-watt bulb.13.50
No. 15325—Same as No. 15324 but equipped for 2-15 watt bulbs.....23.50

FARIES MFG. CO. DECATUR, ILLINOIS



Cross section Showing Indentations.

E·M·T·UP THE QUICK WAY
Two Squeezes and it's Set

TWO QUICK SQUEEZES give you Finer, Faster Conduit Connections. B-M Fittings do away with the twisting, turning and tightening of nuts and save you valuable time and materials. Then too, they are stronger, neater and much easier to work with in tight places. Start using B-M Fittings today. Have more satisfied customers—more profits from each job!

(All B-M Fittings carry the Underwriters Seal of Approval)

DISTRIBUTED BY

The M. B. Austin Co., Chicago, Ill.
Clayton Mark & Co., Evanston, Ill.
Clifton Conduit Co., Jersey Cy., N. J.
Gen. Electric Co., Bridgeport, Conn.
The Steelduct Co., Youngstown, Ohio
Enameled Metals, Pittsburgh, Penn.
National Enameling & Mfg. Co., Pittsburgh, Pa.
Triangle Conduit & Cable Co., New Brunswick, N. J.

Prompt Deliveries on Properly Rated Orders

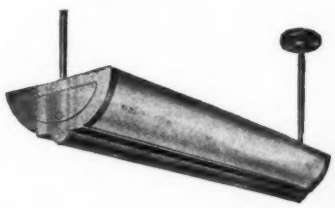
BRIEGEL METHOD TOOL CO. • Galva, Ill.

New Electrical Products

GUTH CADET

A new lighting development, designed to provide best seeing conditions for critical eye tasks in offices, drafting rooms, schools, etc., has just been announced by the Edwin F. Guth Co., St. Louis 3, Mo.

The new Guth Cadet is a "luminous-indirect" type luminaire, and is suspended 24 inches to 30 inches beneath the ceiling in individual or end to end lighting arrangements. The



translucent cream-white deflectors deliver in the ratio of 90% upward and 10% downward; off-white ceilings are recommended with the lighting system for best results. Fixture surfaces are less than one candle power per square inch, assuring correlated relations of brightnesses throughout an entire installation. Fixtures blend in with the lighted ceiling. The overall efficiency in light output is exceedingly high for fluorescent luminaires of its type.

Lighting results from the Cadet system make for easy, surer seeing. The illumination on the vertical simulates that of the horizontal; this insures ease of reading on inclined as well as on flat planes. Pen or pencil lines are easily and quickly discernible due to total absence of direct glare, and near total absence of reflected glare.

The Cadet fixture is made in 48, 60, and 96-inch lengths, for 40-watt, 100-watt, and 40-watt F. lamps, respectively. Cadets are immediately available with suitable priority.

LAMP STARTER

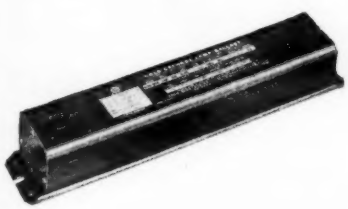
Burkaw Electric Co., 105 East 29th Street, New York 16, N. Y., announces the development of an improved type, extra fast action glow switch starter.

Tri-Umph glow switch starters have two outside terminals, connected to each side of the lamp. When current is applied there is practically no voltage drop across the lamp. An ionization

occurs in the low pressure neon or argon atmosphere tube according to type of lamp. Contacts in the tube are normally open, and are closed through the glow discharge which heats the bimetal U-element and starts preheating of the cathodes. Glow discharge in the starter is eliminated when the contacts are closed and the bimetal cools and returns to its normal position, generating, with assistance of the ballast, its own voltage or "inductive kick" to start the fluorescent lamp. When the lamp is started, the voltage drop across it is sufficient to prevent further starter glow. An additional feature of the new Tri-Umph fluorescent lamp starter is an enclosed condenser to prevent radio interference.

SOLA TRANSFORMER

This new Sola cold cathode transformer is a 900 volt unit designed for the operation of two standard 8 foot, 20 or 25 mm fluorescent lamps with gas pressures ranging from 3 mm to 7.5 mm of mercury. It may be used to advantage with lamps operating under adverse conditions such as show cases and the like where low temperatures are encountered. Although designed for standard lamps it may also be used satisfactorily with custom built lamps of comparable lengths and diameters. It embodies in its construction the Sola constant voltage principle thereby maintaining constant light output from the lamps regardless of line voltage fluctuations as great as plus or minus 10%. Failure of one lamp in no way affects the operation of the other. A roomy outlet box has been provided with 5 knockouts to permit leads to be brought in from top, bottom, end or sides. Manufacturer's Bulletin CC-104 gives complete electrical and mechanical specifications. Sola Electric Company, 2525 Clybourn Avenue, Chicago 14, Illinois.



TVA WATER HEATER

Of particular interest to the homemakers of the nation is the announcement that the Tennessee Valley Associated Marketers, Nashville, Tenn.,

IT'S TIME TO INVESTIGATE TIMERS

WHEN PLANNING your future stocks or installation work, get full information about Paragon Automatic Time Controls . . . because they offer possibilities for handsome profits. These instruments are used in plants of all types and are built into numerous kinds of equipment. They save time . . . multiply human output . . . reduce errors . . . increase efficiency . . . and lower costs. Because they have been extensively used and are widely advertised, Paragon controls offer you the opportunity of large future sales.

HUNDREDS OF APPLICATIONS—Some of the numerous applications of timers are: Protecting component parts, such as electronic tubes . . . Automatically turning air conditioning units on and off . . . Sequence Timing . . . Laboratory Testing . . . Conveyor Control . . . Light Exposure . . . Heat Treating . . . Pump Operation . . . Machinery Operation . . . Plastic Molding . . . Time delay on pump back spin...Controlling pre-heating schedules.

CALL THE PARAGON REPRESENTATIVE . . . for assistance in selection and correct application of Paragon controls.

PARAGON ELECTRIC COMPANY
713 Old Colony Building • Chicago 5, Illinois

Paragon Chicago
BUILDERS OF ELECTRICAL EQUIPMENT SINCE 1901

NEW LOW PRICES See Your JOBBER

IDEAL "WIRE-NUTS"
(Solderless, Topless Wire Connectors)

The new low prices still further reduce the cost of making wire joints in wiring of factories, buildings, homes, etc.

Leading electrical contractors are using millions of IDEAL "Wire-Nuts" because they're better electrically — stronger mechanically. Easy to apply — strip wires, screw on — that's all! Approved by Underwriters' Laboratories, Inc.

Strip Wires, Screw on That's All

PROMPT DELIVERY

Electrical Products Division

IDEAL COMMUTATOR DRESSER CO.
Sales Offices in All Principal Cities

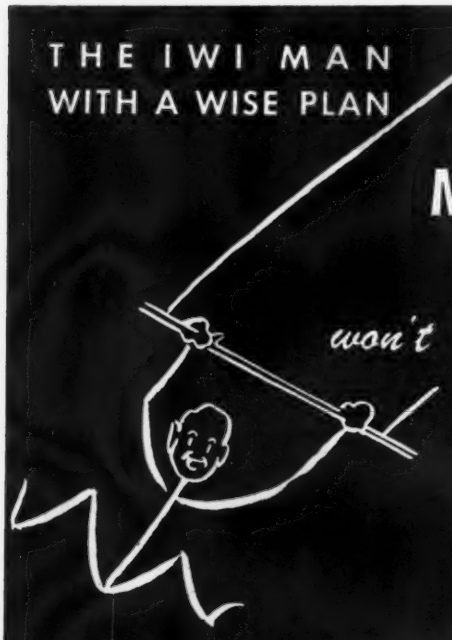
IDEAL *Sycamore*

1017 Park Ave., Sycamore, Ill.

THE IWI MAN WITH A WISE PLAN *finds*

MACALLEN MICA

won't let you down!



MacAllen made Mica products are dependable. Mica paper, cloth, plate and tubing to fill every electrical need.

INSULATION AND WIRES IWI SERVICE

INSULATION & WIRES, INC.
2127 PINE STREET • ST. LOUIS, MO.

soon will put into full production the new Hydromaster automatic hot water heater. It's manufacture is authorized under the O.C.R. Program of the War Production Board.

The Hydromaster is attractively finished in white glass and its top and legs are in wrinkle black. It has a streamlined appearance with a five inch metal strip down the front which can easily be removed to adjust the heat control. First production is of 30-gallon capacity, but sizes up to 80-gallon capacity will follow soon. The tank is insulated with glass fibre which insures perfect conservation of heat. The heating unit is the sealed-in steel type.

O. Z. JUNCTION BOXES

A newly designed line of cast iron junction boxes, embracing many improvements in structure and weatherproofing, has been added to the line of electrical products made by the O. Z. Electrical Manufacturing Co., of Brooklyn, N. Y. They are constructed of close-grained gray iron castings of machineable quality. Clean cut gaskets and careful machining of covers and boxes make them water and moisture proof. Drilling and tapping is

HELWIG SPEER
Carbon Products

Multiflex Brushes
Give

Better Commutation
Longer Life
Less Commutator Wear
That Extra Demand Required
Better All Around Performance

KEEP THE BONDS YOU BUY

HELWIG COMPANY
2544 NORTH 30th ST., MILWAUKEE 10, WIS.
Southern Offices:
323 Northwest Second St.,
Oklahoma City 2, Oklahoma
Telephone: 2-6881
2005 McKinney Avenue, Houston 3, Texas
Telephone: Preston 1610

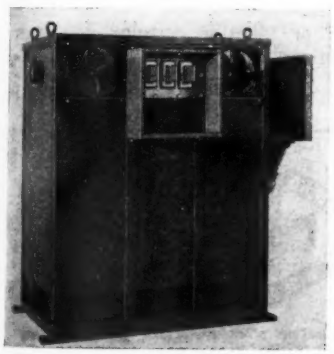
done to individual specifications. Bosses are supplied as required.

The line includes boxes with flanged or unflanged recessed covers for flush or surface mounting or light wall construction, sidewalk boxes, overlapping hinged-cover boxes, and heavy duty junction or pulling boxes. Other boxes, built to specifications can be made for any use.

Complete details of this and other new products, together with the regular O. Z. line are given in a new 140-page catalog. It illustrates and describes, with specifications and price lists, the full O. Z. line including conduit fittings, cable terminators, junction boxes, solderless connectors, power connectors and grounding devices.

DRY TRANSFORMER

The Standard Transformer Company, Warren, Ohio, has designed a new dry type transformer equipped with fans for accelerated air cooling for installation in limited space indoors. The transformer insulation is Class B,



NEMA standard for 80° C. temperature rise, and is composed entirely of inorganic materials such as fiberglas, mica, etc. Fans are thermostatically controlled and operate quietly.

Terminals and attached switches or fusing are positioned in accordance with users specification. The new units are available in ratings up to 1,000 kva, three phase or single phase, and voltages up to 4800. Full story on dry type transformers for all purposes is contained in bulletin S-202, available by writing the manufacturer.

THINNER HIPERSIL

Under tremendous war pressure, signaling systems, radar, and other very high frequency devices have required scores of unusual transformers that never before existed. To meet this demand, transformer engineers have produced units that viewed by ordin-

- For Complete New Wiring Systems
- For Extension Wiring
- For Reconversion Wiring
- For Maintenance Wiring

TYPE SN
FOR GENERAL PURPOSE WIRING

TYPE SNW
FOR WIRING IN WET LOCATIONS

You'll find Flamenol* Building Wire easy to use. It can be stripped and connected quickly. Its small diameter enables more conductors to be used in conduits or ducts. The hard smooth finish of its thermo-plastic insulation aids wire pulling. Moreover, Flamenol Building Wire can be installed in any location. Type SN is ideal for general purpose wiring wherever Type R is permitted. Type SNW is ideal for wiring in wet locations.

The insulation of this wire is practically ageless, has high dielectric and mechanical strength, is flame retarding and is resistant to oils, acids and alkalies. In addition, Type SNW Flamenol wire insulation has low moisture absorption. Both types of Flamenol Building Wire are available in sizes 14 to 2,000,000 CM.

Hear the General Electric radio programs: "The G-E All Girl Orchestra," Sunday 10 P.M. EWT, NBC. "The World Today" news, every weekday 6:45 P.M. EWT, CBS.

BUY WAR BONDS AND KEEP THEM

FOR FURTHER INFORMATION see the nearest G-E Merchandise Distributor or write to Section W251-16, Appliance and Merchandise Department, General Electric Co., Bridgeport, Conn.

*Reg. U.S. Pat. Off.

GENERAL ELECTRIC

"OK"—Says Father Time

20 YEARS OF SERVICE

This photo shows one of the first Clark heaters still in daily use in the home of J. T. Fitchett, Janesville, Wisc., who says:

"The Clark ElectricWater Heater in my home has given satisfactory service over a period of 20 years."

TIME AND TOUGH WATER CONDITIONS PROVE CLARK'S RUGGED DEPENDABILITY

Years of faithful service, often in water conditions so tough as to cause ordinary water heaters to quickly lime up and burn out, offers convincing proof of the rugged efficiency of the exclusive Clark heating principle. Today's Clark heater is better looking than the original models, but the method of heat transfer is identical, offering full assurance of the same time-tested dependability.

McGRAW ELECTRIC COMPANY
CLARK WATER HEATER DIVISION
5201 West 65th Street, Chicago 38

CLARK
ELECTRIC WATER HEATERS
A Toastmaster Product

ary standards are freaks of the first order. For example, consider a transformer no bigger than your fist yet able to deliver 100 kw (for extremely brief intervals, of course). Another complete transformer weighs but one-half ounce. The production of the ultra-thin thicknesses of grain-oriented Hipersil by the engineers of the American Rolling Mill and Westinghouse has helped make possible these unusual designs.

The pressure on transformer designers for small size, light weight, and high capacity in these midget transformers comes from two directions. Much of this equipment is air-borne where the need for weight and space saving is obvious. The other is that as the frequency increases the thickness of the core laminations should decrease. At frequencies of several thousand kilocycles the flux changes so rapidly it is not able to penetrate fully the magnetic material. A sort of magnetic skin effect comes into play. At these frequencies the flux would not penetrate more than five or ten per cent of the standard lamination. Thus to keep down eddy current losses which at these frequencies tend to eat up appreciable proportions of the meager power available, the laminations should be thin, very thin—i.e., have as much surface as possible.

Prewar standard Hipersil laminations were 29 gauge, or about 14 mils thick. Then came 7-mil Hipersil, used extensively for 400-cycle aircraft transforming equipment, with an attendant saving in about 30 per cent in total weight. As rolling-mill techniques improved, the 7-mil strip was outmoded by one 5 mils thick. But for transformers in the high-frequency band and those that deliver power for but a tiny fraction of a second, 5-mil steel is much too thick. To provide an ultra-thin material, an entirely new type of rolling mill was developed and built. With it, grain-oriented steel, consistent in quality and only two mils thick has been produced. It makes possible transformers in which iron cores have not previously been possible because of the intolerably high core losses. Such transformers will, for example, be a great boon in television, which requires high peaks of power in pulses lasting but a fraction of a millionth of a second.

Now engineers have produced on an experimental basis a Hipersil steel only half as thick as the two-mil steel. Four layers of this one-mil Hipersil would be required to equal the thickness of this paper. Such steel when it can be produced on a commercial basis will mean a 20 to 50 per cent further saving in weight, or, more important still, greater powers available for some war and postwar uses of frequencies now at the upper end of the frequency spectrum.

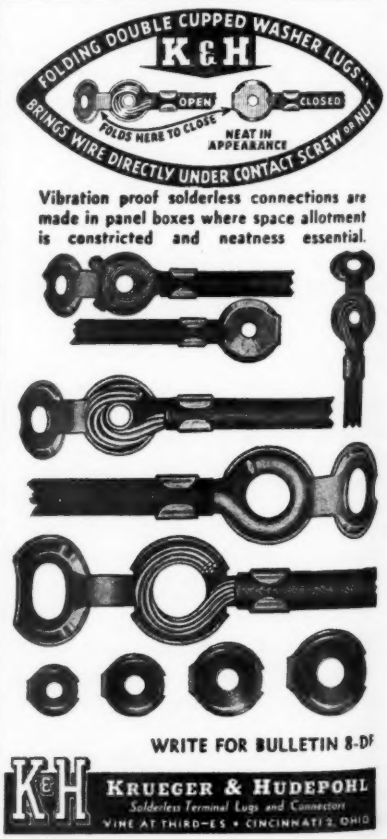
MINERALLAC LITERATURE

New literature and prices have just been released by the Minerallac Electric Company of Chicago on steel hangers for cable, conduit and messenger uses, jiffy steel clips (pipe-clamp), steel straps for messenger cable services on outlet boxes, porcelain insulating bushings and cable-pulling and insulating compounds.

This company also manufactures the well-known "Volt-telling" Statiscope for warning workers by indicating potential in any electrical field. The literature is fully illustrative and shows dimension charts for easy ordering. Inquiries for immediate attention are invited. Write Minerallac Electric Company, 25 North Peoria St., Chicago 7, Illinois.

COLOR CODE CHART

In response to a heavy demand from those who require a quick, easy means of identifying color codings and other features of resistors, the



Vibration proof solderless connections are made in panel boxes where space allotment is constricted and neatness essential.

WRITE FOR BULLETIN 8-DF

K&H KRUEGER & HUDEPOHL
Solderless Terminal Lugs and Connectors
WINE AT THIRD—ES • CINCINNATI 2, OHIO

Stackpole Carbon Company, St. Marys, Penna., has prepared new Resistor Color Code Indicators. Of handy, vest pocket size, these contain complete information on resistor color coding under the American War Standard specifications as well as the joint Army-Navy specifications, both being identical with the R.M.A. (Radio Manufacturers' Association) set-up.

The Color Code Charts are printed on heavy varnished cards and a supply will gladly be sent to those requesting them.

NEW DEMAGNETIZERS

A new line of demagnetizers for completely demagnetizing magnetically soft materials, such as common irons and steels, and partly demagnetizing permanent magnets such as alnico, has been announced by the Special Products Division of the General Electric Company. The new demagnetizers are designed to demagnetize tools, drills, and punches in order to prevent excessive heat and wear caused by the adherence of magnetic chips. They are also desirable for demagnetizing various machined parts, thus releasing fine adhering particles which often cause severe wear and impair accuracy and appearance. In addition, they can be used to adjust and stabilize the magnetic flux in permanent-flux assemblies for such applications as electric instruments and control devices.

Consisting of a cylindrical air-core coil, mounted in a sturdy stand at a convenient 45 degree angle, these demagnetizers are available in a 4-in. size, rated 115 volts, 60 cycles, a-c, and in 8-in. and 12-in. sizes, rated 220/440 volts. Long flexible leads, for connection to the power line, are furnished with the 4-in. size, while a small connection box behind the coil of the larger sizes accommodates standard electric conduit.

THE IWI MAN
WITH A WISE PLAN
knows that

MALLORY
CAPACITORS

Can take it!

Sturdy and strong, built to give good service for a long time, Mallory Capacitors last.

MALLORY
CAPACITORS

are Standardized!

•

So you can meet any capacitor requirements, for round or square types, with less stock on your shelves.

MALLORY
CAPACITORS

are listed in the IWI Blue Catalog, to make selection and purchase easy for you. Send for a catalog today

INSULATION AND WIRES IWI SERVICE

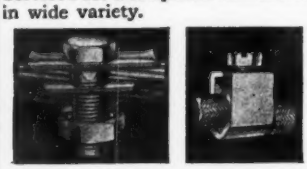
INSULATION & WIRES, INC.
2127 PINE STREET • ST. LOUIS, MO.

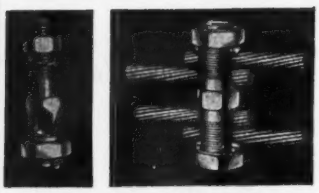
"All SIZES of SERVICE CONNECTORS—

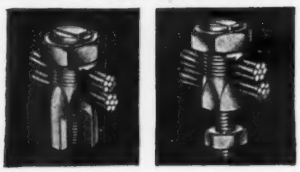
from No. 10 to 1,000,000

and All TYPES"

You can find exactly the service connector you need, in the Penn-Union Catalog: Yoke-and-Nut type, in a complete range of sizes . . . Service Entrance connectors . . . Service Post and Special connectors in wide variety.







Also . . . the most complete line of Tee Connectors, Cable Taps . . . Straight, Parallel, Elbow and Cross Connectors . . . Bus Supports, Clamps, Spacers . . . Grounding Clamps, Terminal Lugs . . . practically every good type.
Leading utilities, industrials, electrical manufacturers and contractors have found that *"Penn-Union" on a fitting is their best guarantee of Dependability.* Write for the Penn-Union Catalog.

L. MORRIS LANDERS
309 Walton Building
ATLANTA, GA.

WALTER J. HUEMMER
Dallas Transfer & Terminal Warehouse Bldg.
DALLAS, TEXAS

PENN-UNION ELECTRIC CORPORATION
ERIE, PA.

PENN-UNION
Conductor Fittings

New Electrical Books

Electrical Drafting

By D. Walter Van Gieson. Published by McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York, N. Y. 140 pages, illustrated. Price $1.50.

This book explains drafting methods as applied to circuits and wiring, presented as a series of illustrated discussions, starting with the schematic circuit diagram and developing the detailed wiring plan for several typical cases, and correlating conduit and equipment location plans. Special attention has been given to recent advances in the field of electrical drafting; modern methods are introduced early in the book and are adhered to throughout.

Dictionary of Engineering

By A. H. Sandy. Published by The Chemical Publishing Co., Inc., 234 King St., Brooklyn, N. Y. 153 pages. Price $2.75.

Compiled in this handy volume are the definitions of many important terms used in machine shops, industries and engineering literature, as gathered by the author during many years of experience both in industry and as a lecturer.

Its clear and simple language will make this dictionary useful not only for engineers and students of engineering, but also for foremen and specialized workmen of the various shops and industries.

Commercial Waxes

By H. Bennett. Published by The Chemical Publishing Co., Inc., 234 King St., Brooklyn, N. Y. 583 pages, illustrated. Price $11.00.

There has been a long-felt need for an up-to-date book on natural and synthetic waxes and wax-like materials which, in modern times, find an extensive use in many industries. Many leading individuals and firms have contributed helpful data and articles to this symposium.

All classes of waxes, such as mineral, vegetable, animal, insect, synthetic and compounded waxes are discussed in detail. The various data such as melting point, form and fracture, purity, hardness, flexibility, moldability, adhesiveness, solubility and many other properties, including sources and uses, are all listed in this comprehensive study. Of particular value is the section on handling and compounding waxes. Tables of compatabilities of waxes with each other, as well as resins, plastics and other materials are an important feature of the book.

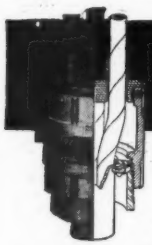
Catalogs — Bulletins

YOUNGSTOWN BOOKLET

Youngstown Kitchens' first major bid for the postwar, new homes market is represented by a new, 24-page booklet, "The Builder's Kitchen," recently off the press.

Youngstown bases its sales appeal to builders on the contention that builders can offer the buying public modern, steel kitchens at no greater cost; can cut installation and finishing time to the bone, and can have the advantage of readily accessible, warehouse stocks in every part of the country.

The booklet will be sent free on



O.Z.

2500 VOLT TERMINATING POTHEADS

For Indoor Use

Designed for indoor use on conduits or exposed cables, this O.Z. terminating pothead is one of a complete line for all types of cables up to 2500 volts. The O.Z. line also includes 750 volt potheads for both vertical and horizontal use along with a complete selection of Sealing and Compound Bushings.

Write for your copy of the 144 page O.Z. Catalog. At a glance, you'll find the answer to your needs in Conduit Fittings ...Cable Terminators ...Junction Boxes... Solderless Connectors ...Power Connectors... Grounding Devices.

O.Z. ELECTRICAL MFG. CO.
362 BOND STREET · BROOKLYN, 2 N.Y.

Represented by: M. L. Whitman, 313 Bona Allen Bldg., Atlanta 3, Ga.; W. J. Keller, 304 Natchez Bldg., New Orleans 12, La.; F. B. Ostermueller, 6935 Meadow Lake Ave., Dallas 14, Texas.

⊕7880

request by writing to Mullins Manufacturing Corporation, the Youngstown Pressed Steel Division, Warren, Ohio.

FLASHLIGHT BATTERY

An information bulletin giving a great deal of technical and semi-technical information on its rechargeable wet storage battery for flashlights and the methods of recharging it has just been published by the B. F. Goodrich Company, Akron, Ohio, and is now available upon request. The bulletin recommends charging procedures and gives much useful information on the care of the battery and its rechargers.

VARNISH STANDARDS

The proper selection of the type and grade of flexible varnished tubing and sleeving for various insulating requirements has been greatly facilitated by the comprehensive set of standards adopted by the Varnished Tubing Association, Inc. The new standards cover tubing and sleeving made from cotton, rayon, nylon and glass and include the physical and electrical characteristics of the different standard grades that are available, and the manner in which they should be designated when ordered. The new standards have been published in 8½ x 11 size for convenient use and filing. Copies may be obtained from the Varnished Tubing Association, Inc., 420 Lexington Avenue, New York 17, N. Y.

SUPERIOR FLUX BULLETIN

A new 4-page bulletin issued by Superior Flux Company, 913 Public Square Bldg., Cleveland, Ohio, describes Superior No. 6 Flux for silver soldering (patented), and gives detailed instructions for its use. Superior No. 6 is an alkaline, non-corrosive, non-fuming flux, containing no free fluorides with an effective temperature range of 800 degrees (850° to 1650°). It is said to have a strong prolonged action on metal oxides and also a powerful capillary action on the molten solder. It can be used with any low melting point brazing alloys or silver solders, for joining both ferrous and non-ferrous metals and alloys. Complete price information and laboratory and production test reports are included in the bulletin; also, twenty other welding and brazing fluxes in the Superior line are listed.

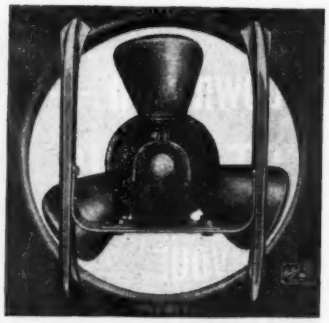
SQUARE D CATALOG

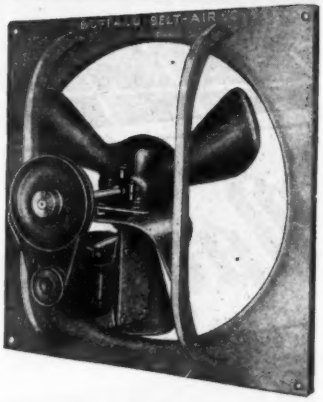
The Square D Company, 6060 Rivard St., Detroit, Mich., manufacturers of electrical equipment, announces the release of a Fall 1944 edition of the Square D Digest Number 129, dated September, 1944. This is an abridged catalog containing numerous photographs and listings of products not listed in the previous issue.

The Square D line includes safety switches, service equipment, multibreakers and other circuit breakers, panelboards, bus and feeder duct, motor control and pressure switches.

MICROMOTOR FOLDER

A new four-page specification folder just off the press is announced by A. G. Redmond Co., Owosso, Michigan. It covers standard Redmond Type "L" light weight, shaded pole AC Micromotors in sizes up to 1/40th horsepower. Copies of the folder are available upon request.





Efficient, heavy-duty Industrial Fans

There's a vast difference in a fan built for intermittent use in a bowling alley or drug-store, and one designed and built for 24-hour-a-day operation in a steel mill.

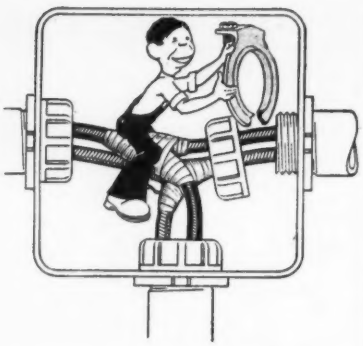
Buffalo Fans are the heavy-duty type, with the built-in reliability that hard service calls for. They are accurately rated as to air delivery, so efficiencies can be figured correctly.

Dealers, Special Attention: **Right now is the time to get lined up for the post-war sale of Buffalo Fans. Your customers know that Buffalo Fans have an established reputation for high quality. They also know that Buffalo ratings are certified. If you want to sell Buffalo Fans write today for data bulletin 3222 and prices.**

ARMY E NAVY

BUFFALO FORGE COMPANY
205 Mortimer St. Buffalo, New York
Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

"Buffalo" "BREEZO" and "BELT-AIR" Ventilating Fans



HOW T&B GROUNDING WEDGES

Save on Installation Work and Material for Old or New Work

HERE'S HOW

Simply loosen your standard conduit bushing, slip your T&B Patented Grounding Wedge over the wires without disturbing them, and screw your bushing back into place. To complete the job, you merely tighten up the Wedge with a screwdriver.

These T&B Grounding Wedges are Approved by the Underwriters Laboratories either with or without the use of jumper wire. They form a mechanically and electrically perfect bond between conduit and outlet box and provide one continuous metallic path to the ground, replacing jumper wires at boxes.

Made of bronze, the flange of the Wedge is accurately machined to fit easily and snugly into the knockout. They come in thirteen sizes from ½" to 6" and, like all other T&B products are sold through the service organizations of T&B Distributors exclusively.

Write your nearest T&B Office for Bulletin S-7. It gives full information on these T&B Grounding Wedges as well as on the complete line of T&B Built-in Solderless Ground Fittings.

The Thomas & Betts Co.,
Incorporated
Room 423
Citizens & Southern Bldg.
Atlanta 3, Ga.

The Thomas & Betts Co.,
Incorporated
P. O. Box 2372
Charlotte, North Carolina

The Thomas & Betts Co.,
Incorporated
518 Masonic Temple Bldg.
New Orleans 12, La.

T&B
THE THOMAS & BETTS CO.
INCORPORATED
manufacturers of electrical fittings since 1899
ELIZABETH, 1, NEW JERSEY
In Canada: The Thomas & Betts Ltd., Montreal

Motor Driven Brushes

(Continued from page 32)

corners and removing coatings or lacquer where not wanted.

With past experience in mind, the manufacturer made power brushing part of the production process as soon as the new job requiring interior cleaning of the stator was set up in the plant. The method (See Fig. 1) is to operate the brush in a portable air grinder hung on a sling. The stator is held stationary, either by a fixture or its own weight. With the brush operating at 3600 revolutions per minute, the operator pushes it into the stator.

The brush (See Fig. 2), used as an Osborn Riehl Wire Wheel Brush, 4-inch diameter, of a section thickness approximately 7/16-inch, filled with .003 size wire. Brushes are used in sets of three or four.

Power brushing enables the user to complete the stator cleaning in two or three minutes, making short work of the operation compared to more tedious cleaning methods. It has the further advantage of blending the metal surfaces by smoothing scratches and blemishes acquired during manufacture and handling.

Turning Wartime Service Problems into Profits

(Continued from page 28)

there will be many improvements and that the kitchen especially will come in for its share of improvements in wiring.

"The postwar kitchens are almost certain to be equipped with range receptacles," he believes. "Electric ranges are fast growing in popularity, especially in this section of the South where low power rates make such ranges reasonably economical. Receptacles for ranges can be put in at much less expense when the house is being built, and there is the elimination of the inconvenience of doing it later. Building codes probably are going to include range receptacles in the near future."

The Baker Electric Co. has been pretty hard hit by the shortage of skilled electricians and has had to use some "green" electricians at times. Baker expects better and younger electricians after the war when the boys will be coming home to doff khaki for overalls. Many young soldiers, as well as sailors, are now gaining valuable electrical experience while in service. They will know a lot of the answers and fit into the reconversion picture well, he believes.

Incidentally, Baker has the service man's point of view. He did some Nicaragua campaigning while in Marine aviation before he jumped into the electrical business. So he is all for the boys who will be coming back looking for jobs.

Recently an Army hospital case—a soldier back from Guadalcanal—joined the Baker shop crew to work on electrical appliances for several weeks while recuperating in Memphis.

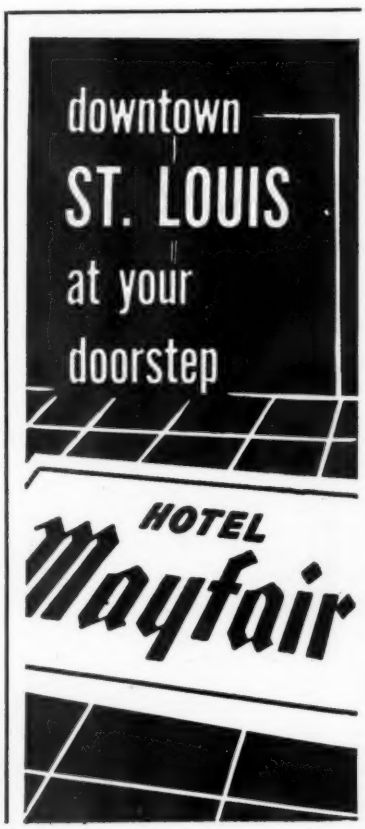
"That soldier's repair work was good. He will have no trouble getting a job as an electrician after leaving the service," Baker declares.

And, with the Baker Electric Co. expanding, there will be jobs for a lot of the young fellows just like him after the war, too.

Maintenance is Big Business

(Continued from page 17)

To all of you who have the daily care of electrical machinery, the growler and shooting box are commonplace maintenance tools. How many of you, however, realize that when you touch the electrodes of the test box to the copper and ground, you are testing



the insulation at its thinnest point between the copper and the frame or other grounded part. This, of course, is satisfactory as far as it goes. It does not, however, give any indication of the condition of the insulation between turns of a coil.

Through the medium of high frequency testing, it is now possible to detect weak spots in the insulation between individual coil turns and weed out weak sisters that would not normally show up with the shooting box alone. While this is a tool developed primarily for the production of new motors, generators, etc., it has been adapted to maintenance purposes in the repair of such devices. Just another one of the musts for better maintenance and longer operation of our apparatus.

Out of this war has come a greater appreciation of the value of maintenance in our general economy. Let us hope that some of this built up enthusiasm will carry over after the war. You whose duty it is to see that the machinery is kept running don't have to be reminded of the importance of this subject. Let us hope that the budget directors don't overlook it when they lay out their postwar plans.

What's Ahead In Lighting?

(Continued from page 12)

cent survey shows that one-half of the lighting in stores today consists of bare fluorescent lamps, installed without proper guidance and direction. Consequently, it is quite apparent that a concerted effort on the part of the entire lighting industry is necessary to educate their customers on those things which serve their best interests.

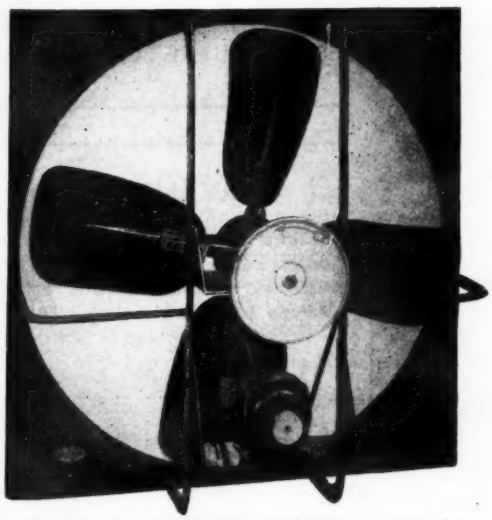
With the assistance of architects, and by designing adequate general lighting, along with a sufficient amount of supplementary, plus-lighting, the stores of the future may truly be made to conform to the 3-A's principle of good merchandising policies, namely: *attraction, atmosphere and appraisal* After all, the psychology of brightness and brightness contrast in the lighting of display areas is to enable the customers to see what you want them to see and go where you want them to go. Properly designed lighting can do just that.

As we have gone up the scale in footcandle intensities, the lighting engineer has become increasingly conscious of the importance of the brightness factor as a basis of design. This does not mean footcandles can be dispensed with but it does mean that brightness may become a determining factor in the 3-A's principle of what good store lighting should do, namely, to provide that form of lighting which will render: the maximum of attraction when and where it is needed, an inviting and pleasing atmosphere, and a type and quality of light to permit comfortable and quick appraisal of the merchandise.

In order to more satisfactorily apply the three principles of brightness to the greatest benefit of the store-owner, we have recently established a new scientific formula known as the "1-3-5" brightness ratios. That is to say, to make customers see what you want them to see and go where you want them to go is largely a matter of proper attraction and atmosphere accomplished by the right kind of brightness contrast. So, for every one footcandle of general lighting, our 1-3-5 formula specifies that there should be about 3 footcandles in showcases, wall shelves, etc., and other areas generally denoted as sales areas where the merchandise is seen, handled and bought; and then 5 footcandles for every footcandle of

Health-aire Belt Driven Propeller Fans . . .

Available in all sizes 24 to 54 inches and capacities 4,500 to 25,000 C. F. M.



Anticipate your requirements now! Write for full details concerning our plan that will supply you with your summer needs.

Backed by 25 years experience in designing and manufacturing propeller fans and blowers, Johnson Health-aire belt driven fans combine the most advanced, the most effective engineering ideas.

For all residential, commercial, industrial and public buildings, also, offices, stores, and all other similar places, Johnson Health-aire fans are guaranteed to give the finest performance.

Available in sizes 24 to 54 inches and in capacities of 4,500 to 25,000 C.F.M.

FEATURES

- All steel welded construction.
- Capacitor, long hour, resilient mounted motors.
- Dynamically and statically balanced for quiet operation.
- Adjustable tension, over-powered drives.
- Rated and tested in accordance with ASHVE and NAFM codes for propeller fans.

JOHNSON Health-aire PRODUCTS Climate at your Will

H. C. BIGLIN, 177 Harris St., N. W., Atlanta 3, Ga.

JOHNSON FAN & BLOWER CORPORATION

general illumination for special, permanent feature display such as niches, models, displays and advertising pieces on top of wall cases, etc.

Finally, in order that the brightness of the lighting equipment or lamps does not unnecessarily distract the customer's attention, we utilize that old familiar brightness ratio formula by stating that the luminaires, or any part, thereof, should not be more than ten times as bright as anything else in the store.

Lastly, we expect to see in tomorrow's store a trend towards recessed and in-built lighting, and the newly expanded lines of both incandescent and fluorescent lamps will help the designer and architect in this field.

We believe that more interest than ever will be directed towards residential lighting, because of the present housing shortage and the desire of the public to provide greater comforts and conveniences in the new homes to be built for the families of demobilized veterans of World War II.

Fluorescent lamps will come into the home as never before, particularly with portable lamps incorporating the new circular line of F lamps, 20, 30, and 40 watts, of 8½, 12½ and 15½ inch diameters, respectively. In addition, other fixtures are being designed, using either the circular or shorter length F lamps to create less bulky and better balanced luminaires of distinction and beauty. Perhaps we will see the day, after the war, when continuous troffers will be constructed around the room and various circuits provided so that either all of the lamps about the entire room may be turned on, or just individual sections, at a time and place where reading and sewing is to be done.

In view of the objectionable brightness from exposed fluorescent lamps, in areas very largely used for close visual work, there seems to be a very definite trend towards the design of indirect types of fluorescent lighting fixtures for use in school classrooms and offices. "F" lighting may be used in indirect fixtures advantageously, without the disadvantages experienced formerly with incandescent lamps where the ceiling became excessively bright above each fixture as the wattage of the lamp was increased. This is quite understandable when we stop to reflect that the F lamp is a linear light source with the lumens spread out over a relatively large area, as compared with the concentrated, glaring light of a filament light source.

Furthermore, the new recommendations will undoubtedly call for spreading the lamps out over the ceiling, instead of bunching them together in one fixture, so as to produce more even ceiling brightness and less brightness contrast. One proposal is to the effect of developing single lamp troffers, instead of double lamp troffers, to follow along on this idea of spreading out the light.

Another program which we should shortly hear a lot about is one concerning the proper maintenance of lighting equipment. It certainly is not good economics for the customer to receive less than half of the light that he may be paying for, and can rightfully expect to receive, simply because no definite nor specific schedule of cleaning the fixtures and replacing burned out lamps has been included in the "bill-of-sale." Furthermore, such conditions, when allowed to exist, are a pretty poor reflection upon the lighting industry.

To solve this problem we are looking forward to the time when lighting maintenance companies may be formed in very large business and industrial centers, either as separate and distinct institutions, or else forming a special department set up by electrical contracting firms.

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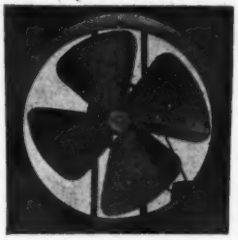

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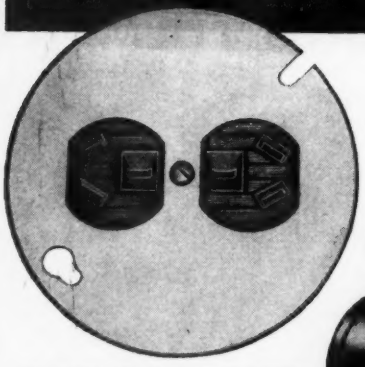

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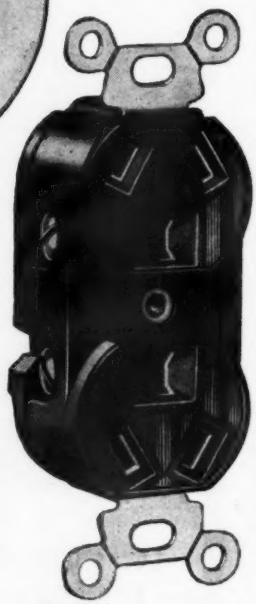

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